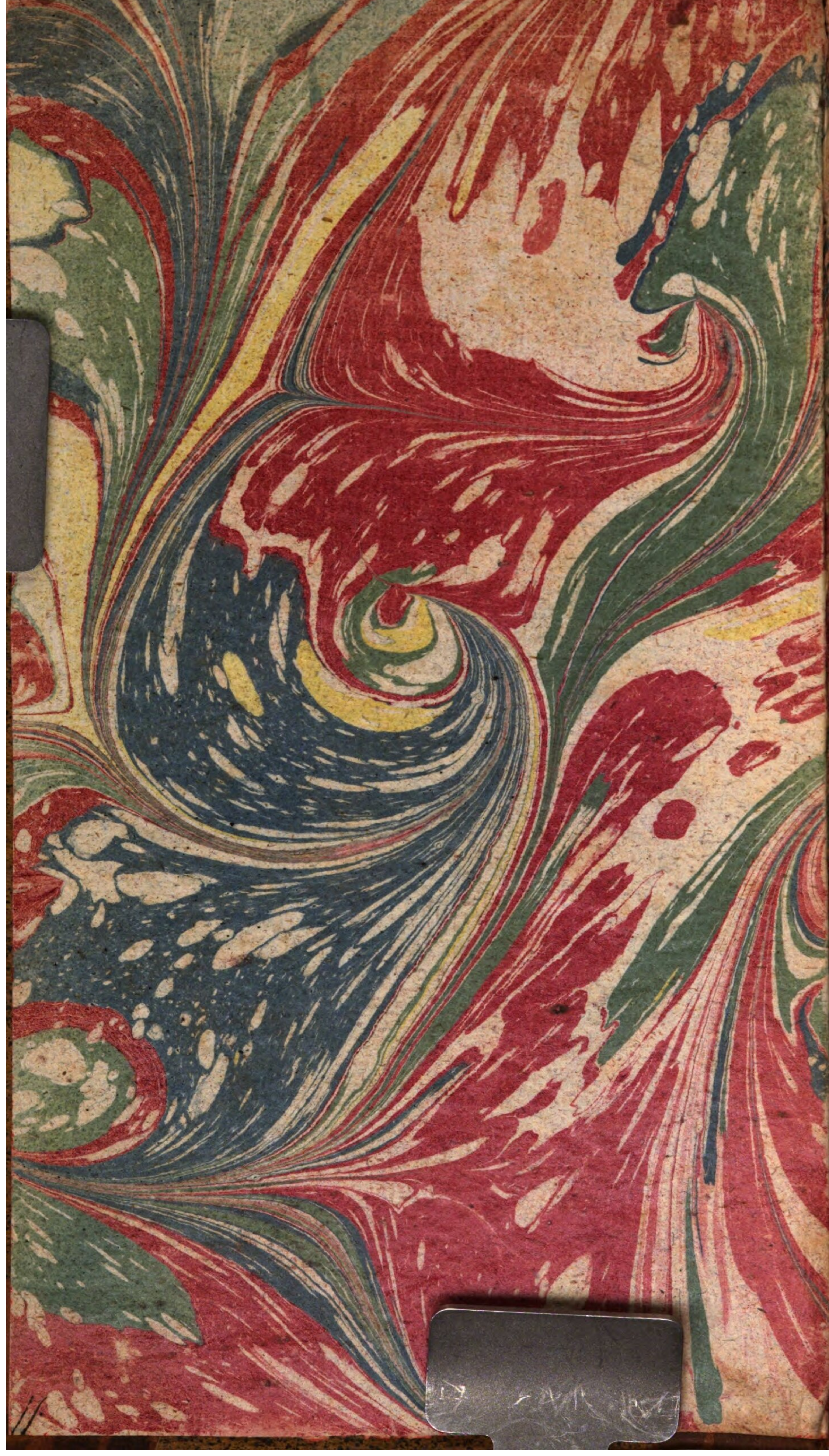




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F O S S I L S

A R R A N G E D

ACCORDING TO THEIR

OBVIOUS CHARACTERS;

WITH THEIR

HISTORY AND DESCRIPTION;

UNDER THE ARTICLES OF

F O R M,
H A R D N E S S,
W E I G H T,

|| SURFACE,
COLOUR, AND
QUALITIES;

The PLACE of their PRODUCTION,

T H E I R U S E S,

A N D

Distinctive ENGLISH, and Classical LATIN NAMES.

By J. H I L L, M. D.

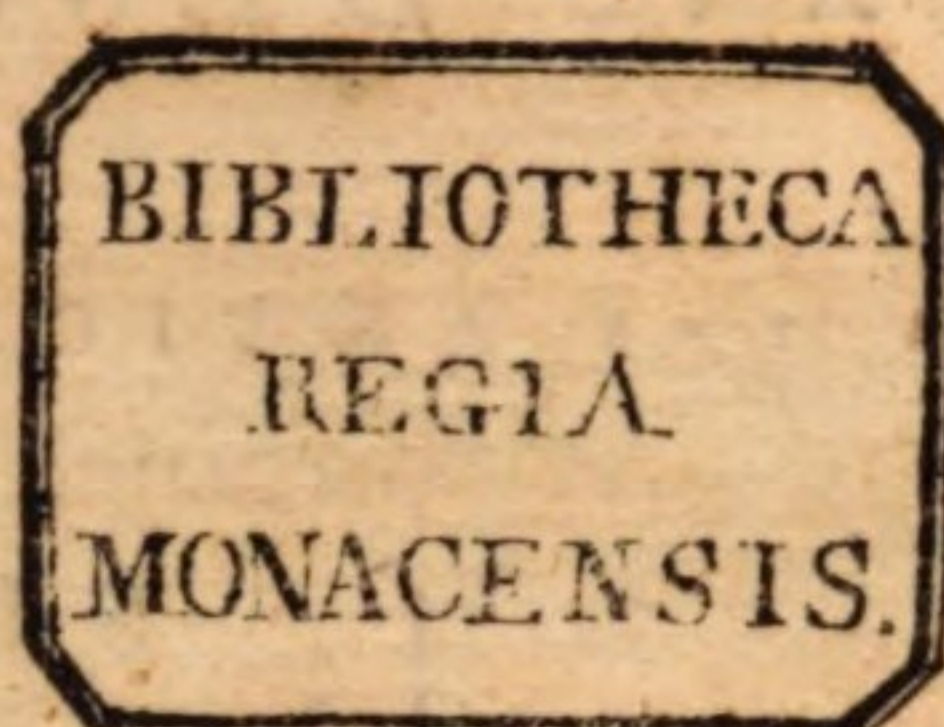
MEMBER OF THE IMPERIAL ACADEMY.

L O N D O N:

PRINTED FOR R. BALDWIN, IN PATER-NOSTER ROW;

AND P. ELMSLY, IN THE STRAND.

M.DCC.LXXI.



INTRODUCTION.

TH E purpose here is to lay down an arrangement of Fossils; founded on their obvious characters, and sensible qualities: according to which they may be known, and disposed in method; without the *skill* of Chemistry, or the fatigue of experiments: without furnaces, or aqua fortis.

Those arts and instruments may be needful to ascertain their nature; but we are here employed only on their outward form, and character: the other part of the science, which is indeed the most essential, will follow the more easily: for things, before they are deeply examined, ought first to be known.

In this method nothing will be admitted as an article of distinction, but what is to be perceived at once, by the sight, smell, taste, or touch. Good sense alone will be required to arrange Fossils according to these palpable and unerring guides; and the system will serve for all cabi-

nets; because it comprehends all the Fossils that are known to exist.

From these determinations alone of our senses, will be given a detail of the differences we find in Fossils; under the heads of Form, Hardness, Weight, Surface, Colour, and Qualities, as distinguished by the taste, smell, or touch.

These distinctive marks will be disposed separately in so many columns; and to these will be added two more for the history of the bodies: comprehending the place where they are found; and uses to which they serve.

Thus the few words in our six first columns read together, will give the *Specific Character* of every Fossil: and those of the two last will add what is essential in its history and value.

A Table of Classes will be prefixed to all; in which the method will appear at one View.

The distinction of each Class will be added at the head of each: and after this, subordinate characters of the several genera. These, like the rest, will be founded only on obvious characters; and from these the detail of species will be regularly pursued.

These

These Characters cannot be so absolute and determinate, as those which mark the like great distinctions among Animals and Vegetables. It is impossible they should: Fossils, not being organic bodies, produced by eggs or seeds, are not themselves so determinate and distinct: and it would be preposterous to attempt in the distribution, what nature has not done in their construction.

The greater distinctions are the nearest being absolute; for so much the simplicity of nature in these bodies allows: all subordinate differences are less determinate; and the lower we descend, the more equivocal must be the marks. The Characters of Genera therefore are liable to exception often; and those of what we are content to call Species, in this Kingdom, always.

The great and essential difference of Species and Variety, so useful in Plants, is lost in Fossils; it would be happy if it were otherwise: but 'tis idle to speak of things any way but as they are.

The terms of difference between Species and Species, are every where expressed at the heads of the several columns; and these are all placed in each Page, because usually most of them are requisite; though 'tis according
to

to the general nature of the bodies, that one or other of them becomes most essential: each Class has its different qualities, that more or less determine the Species of the objects it comprehends; and in this way all the marks are always ready.

Thus in *Stones*, the Characters of FORM, HARDNESS, WEIGHT, and SURFACE, are most essential; among the *Crystals* and *Spars*, FORM and COLOUR; with *Earths* and with the *Talcs*, FATTINESS; in the *Salts*, TASTE; and with the *Sulphurs*, SMELL. The terms of place belong to all; and (where they have been brought to serve the purpose of Life,) their uses.

In the application of these terms to the several Fossils, they are always given comparatively; and have reference to the other Bodies of the same Genus. The Classes separate very different things from one another; and the lesser distinction of Genus yet farther divides those of each alliance: the Character of the Class, and that of the Genus, are always to be carried in the mind, in addition to the distinctive mark of the Species: and as the articles expressed in our columns are intended to refer only to the Fossils of the same name, when 'tis said that bodies are hard, or soft, light, or heavy, it means nothing absolute; but is only to be under-

understood as hard, or soft, in comparison of others of that kind : and so of all the rest.

In the same manner the article of place is not meant as singular, or particular; for many Fossils are in a manner universal : 'tis only intended to say, that such or such a Country is one of those where this or that Fossil is found.

With respect to other Authors, their systems have been founded on principles so different from those which direct all things in this, that references to them are not very necessary : the information intended to be given here, is meant to be conveyed at once ; and to be itself sufficient for the distinctive knowledge of the body. However, to comply with custom ; and mark the way to farther enquiry, the name of the Author, who seems to have best understood the body in question, is annexed always to its Latin name, by the initial letter. The Reader will be pleased therefore to know, that in these places,

W stands for Wallerius.

B for Bomare.

L for Linnæus.

H for my history of Fossils.

And that where the letter N is added, the Body described is a new Species.

As

As I have had the advantage of more than twenty years experience since the publication of the Book just named; I find I shall have many Species to add, which were not known at all at that time; and several to retrench, which are better known now: and where the same faithful guide directs me, I shall not scruple to take the same liberty with the **opinions** of others, as to the Species; that I have taken with my own.

Large Histories may be written on the nature of the several subjects; but the purpose here is nothing more than that previous acquaintance with the Bodies, which is the first essential enquiry: the plan is to make that as certain, as obvious, and as familiar, as the nature of the subject will admit: and of all things, to express it in as few words as possible.

The annexed table will give the course of the arrangement that is to be used: in which, it seems essential to begin with the simplest bodies: for otherwise, 'tis impossible to comprehend the description of those which are composed of several kinds.

NATIVE

NATIVE FOSSILS.

CLASS I.

TALC.

TALCUM.

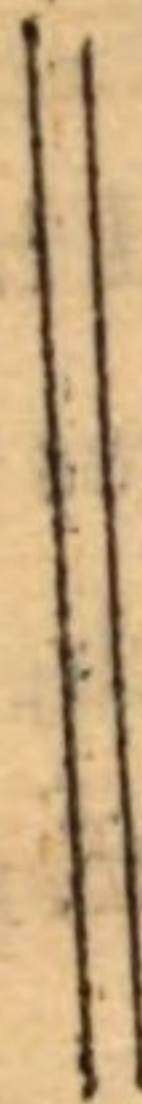
A pure Fossil : composed of flexible and elastic
Plates.

TALC is LIABLE TO BE tinged by mineral Steams ;
clouded by subterranean Fires ;
fouled by admixture of earths ;
broken by the force it suffered while among
fluid Matter ;
distorted by the concretion of Stones, in which
it lies ;
debas'd by an admixture of their Matter ;
and intermixed with similar Fossils.

Hence, tho' naturally transparent, it becomes sometimes opake ; alters its form ; and loses in like manner of its flexibility.

Therefore Talc, in the condition we see it in the earth, is to be separated into various Genera, and Species ; according to those differences, and other accidents.

T A L C.



G E N U S I.

I S I N G L A S S.

V I T R U M.

Composed of broad, flat, close, polished Plates,

FORM	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. MUSCOVY ISINGLASS.							
In broad masses	the plates flexible	very light	glossy	BROWNISH	soft	Russia, in rocks	Mica Membranacea, W. for windows, lan- terns, &c.
2. DANISH ISINGLASS.							
Large thick masses	plates tough	heavy	shining	WHITISH	fatty	Denmark, Sweden, Norway	Mica Laminosa, L. windows.
3. INDIAN ISINGLASS.							
Thin cakes	plates most flexible	very light	polished	PALE YELLOW	unctuous	Coromandel	Verre de Muscovie jaune. B. as glafs.
4. PERSIAN ISINGLASS.							
Round lumps	plates elastic	quivering	shivery	PALE RED	smooth	Island of Ormuz, in red earth	Vitrum Perficuum. H. covering mi- niatures.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. FRENCH ISINGLASS.							
Broad cakes	plates scarce elastic	heavy	undulated	BROWN	fatty	Champaign, in rocks, by rivers	Vitrum Gallicum. H. as glafs, but poorly.
6. ICELAND ISINGLASS.							
Broad maffes	plates brittle	light	shivery	WHITE	harsh	Mount He- cla	Vitrum Mandicum. N.
7. HUNGARIAN ISINGLASS.							
Irregular lumps	plates brittle	heavy	scaly	YELLOW	unctuous	Cremnitz, in mines	Mica Hungarica. L.
8. ORPIMENT ISINGLASS. ORPIMENT.							
Uneven maf- fes	plates brittle	heavy	undulated	GREENISH YELLOW	fatty, ful- phureous	Saxony, in mines	Vitrum Auripigmentum. H. a yellow paint

T A L C.

G E N U S II.

G L I M M E R.

M I C A.

Composed of small, loose, irregular, shining Scales.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GOLD GLIMMER.							
In small rough masses	rigid	heavy	scaly	YELLOW.	dry	Germany*	Mica Aurea. W.
2. SILVER GLIMMER.							
Larger uneven lumps	flexible	light	wavy	WHITE	fatty	Germany	Mica Argentea. W.
3. GREEN GLIMMER.							
Small rough lumps	hard	heavy	scaly	BRIGHT GREEN	harsh	Germany, in mines	Mica Viridis. W.
4. BLACK GLIMMER.							
Great rugged lumps	very hard	heavy	oblong and streaky	BLACK	harsh	Denmark, in mines	Mica Decussata. L.
5. RED GLIMMER.							
In small rude lumps	tender	heavy	rugged	RUDDY	fattyish	Saxony, in mines	Mica Rubra. W.

6. VENETIAN GLIMMER.

VENICE TALC.

In uneven
masses | soft | heavy

7. CONVEX GLIMMER.

In small half-
round lumps | tender | light

8. UPRIGHT GLIMMER.

Large and
uneven | stony | heavy

9. TWISTED GLIMMER.

Rude masses | soft | heavy

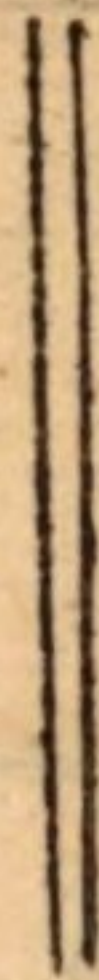
10. STREAKY GLIMMER.

Flat pieces | brittle | heavy

Mica Talcosa, L.	a cosmetic.	Norberg, in rocks	most fatty	GREENISH WHITE	undulated
		Finland, in clay	smooth	SILVERY	coated
		Sweden, in mines	harsh	WHITISH	rais'd, three-cor- ner'd, split
		Hartz forest, in mines	fatty	YELLOW	wavy
		Saxony, in rocks	dry	GREY	thready
Mica Hemispherica, W.					
Mica Crystallina, L.					
Mica Undulata, W.					
Mica Radians, W.					

* Perhaps this is the Mica Nigra, calcined by subterranean Fires; for that becomes yellow, when burnt.

T A L C.



G E N U S III.

B L A C K L E A D.

M O L Y B D Æ N U M.

Composed of minute, fatty, irregular, and close-connected Scales, staining the hands.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE BLACK LEAD.							
Compact	tender	light	smooth	GLOSSY BLACK	fatty	England and Germany, in hills	Molybdænum Impalpabile. L. lead pencils.
2. SCALY BLACK LEAD.							
Brittle	soft	heavy	tily	DEAD BLACK	smooth	Sweden, in mountains	Molybdænum Subsquamosum. L. pencils.
3. PLATED BLACK LEAD.							
Shattery	brittle	light	uneven	GREY BLACK	soft	Germany, in mines	Molybdænum Sablanellosum. L. pencils.
4. DUSTY BLACK LEAD.							
Scoty	firm	heavy	rough	BLACK	dry	Goffelaer, in mines	Molybdænum Compactum. L. a black paint.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
5. PERPLEX'D BLACK LEAD.							
Streaky	hard	heavy	thready	BLACK	rough	France, in rocks	Molybdænum Intricatum, L. a blacking
6. RADIATED BLACK LEAD.							
Streaked	hard	heavy	raised in ridges	GREYISH BLACK	dry	Sweden, in mines	Molybdænum Radiatum. L. for colouring earthen ware
7. KIDNEY BLACK LEAD.							
Chaffy	soft	light	dufty	DEAD BLACK	dry	Germany	Molybdænum Reniforme. L. for crucibles

8. SANDY BLACK LEAD.

Rugged

crumbly

heavy

9. WOLF BLACK LEAD.

Uneven

soft

very heavy

C₂

10. DINGY BLACK LEAD.

Gritty

very hard

heavy

11. BRIGHT BLACK LEAD.

Flaky

hard

heavy

uneven

BROWN
BLACK

harsh

Banks of the
Rhine

Molybdæna
Impura.
W.

a coarse colour.

wavy

REDDISH
BLACK

very
unctuous

Westmore-
land, in the
hills

Molybdænum
Sperma Lupi.
L.

a good ordinary
colour.

confused

GREYISH
BLACK

unctuous

Upland

Molybdæna
Tessularis.
W.

raised in
dice

YELLOWISH
BLACK

fatty

Bohemia

Talcum
Cubicum.
B.

TH E Structure of these, and the Bodies of the three following Genera, are best seen in the sides of rough masses ; rude as they are taken from the earth : where these are wanting, it is best seen in a piece newly broken, viewed crosswise.

In general, where the eye is not able to see it plainly, a reading-glass is to be used ; and for the most confused kinds, a glass of more power.

T A L C.

GENUS IV.

SOAPROCK.

SMECTIS.

Composed of small, regular, fatty, tender, and close-connected Flakes; formed into a compact smooth mass.

WE shall begin to see, in this Genus, and from thence be led perfectly, in the three succeeding ones, to distinguish the way by which Nature gradually descends, from the purity and perfection of the finer Bodies in each Class; to those so foul, and imperfect, that we at last lose sight of what they are.

The opake black Touchstone differs as much from the bright Russian Isinglass, as one thing well can differ in its aspect from another: yet, when all are thus traced through their gradations, we cannot doubt but it is the last of Talcs.

The Characters of these Fossils are plainest in the purest; the Isinglass: but even there, the Hecla kind loses its transparency. They begin to degenerate in the Glimmers; they are yet less distinct in the Black Leads; and in these Soaprocks, and the succeeding Genera, the eye scarce perceives the plated structure: but still they are, in all, the same. Unformed Talc, or the substance of the Talcs, not formed into plates, often mixes with their flakes; and confuses them: but having seen these flakes in the purest Isinglass, they will be traced by the eye a great way thro' the Glimmers: a little assistance will shew them in Black Lead, and even in all these: and all the while, their smoothness to the touch, and fatty quality, deduced only from their broken plates, declare them every where.

The more opake of these Bodies will be repeated under the head of hardened earths, &c. with references to their just place here: and this seems as much as Nature allows to the methodical arrangement of Fossils; which have not been formed with those absolute and distinctive characters we trace in the two higher orders of created Bodies.

SOAPROCK.

SOAP ROCK.

[23]

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CORNSH SOAPROCK.							
In rude lumps	tender	heavy	marbled	RED AND WHITE	very fatty	Cornwall	Talcum Smectis Opacum. L. for porcelain.
2. CHINA SOAPROCK.							
In great masses	hard	heavy	rugged	GREYISH WHITE	fatty	China	Talcum Smectis Steatites. L. in the fine porcelain.
3. SWEDISH SOAPROCK.							
Flat cakes	soft	light	polished	RUDDY	very fatty	Sweden	Talcum Smectis Lamellosum. L. cleaning woollen cloths.
4. GERMAN SOAPROCK.							
In small lumps	tender	light	rugged	WHITE SPOTTED WITH RED	soft	Hartz forest	Talcum Smectis Subdiaphanum. L. cleaning woollen cloths.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. GREY PLATED SOAPROCK.							Talcum Lamellare. L.
Flat cakes	brittle	heavy	smooth	GREYISH	fatty	Sweden	for marking.
6. BLACK PLATED SOAPROCK.							Talcum Corneum. L.
In thick cakes	very hard	very heavy	smooth and polished	BLACK	oily	Germany	for marking.
7. LEATHER SOAPROCK.							Talcum Coriaceum. L.
In thin cakes	soft	light	uneven	PALE BROWN	fatty	Sweden	
8. ROSE SOAPROCK.							Talcum Carneum. L.
Rude lumps	tender	heavy	raised in convex flakes	ROSE-CO- LOUR	very soft	Sweden	cleaning wool.

9. GREEN SOAPROCK.							Talcum Viridans. L.
Uneven lumps	soft	very heavy	dufty	DEEP GREEN	dry	Germany	
10. RED SOAPROCK.							Talcum Rubrica. L.
Vast masses	soft	heavy	uneven	DULL RED	fatty	England	for marking.
11. WHITE SOAPROCK.							Talcum Lithomarga. L.
Flat masses	soft	light	dufty	WHITISH	fatty	Switzerland	
12. FRENCH SOAPROCK. FRENCH CHALK.							Le Talc Verd de Briancon. B.
In great flat- ted lumps	hard	heavy	smooth	GREENISH WHITE	very fatty	France	for marking.
13. SPOTTED SOAPROCK.							Le Talc Verd Marbré. B.
Small flattened lumps	soft	light	uneven	GREY AND GREEN	fatty	France	for cleaning cloaths.

T A L C.

G E N U S V.

P O T S T O N E.

O L L A R I S.

Composed of broad, narrow, and uneven Flakes, mixed irregularly together.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. SOAPY POTSTONE.							
Great masses	hard	very heavy	uneven	MOTTLED GREY AND GREEN	fatty	Sweden	Pierre Ollaïre. W. for vessels to bear the fire: it hardens to a stone in burning.
2. TENDER POTSTONE.							
Rude masses	soft	heavy	irregular	GREY AND RUDDY	very fatty	Switzerland	Pierre de Côme. B. for pots to bear the fire.
3. COARSE POTSTONE.							
Large masses	hard	heavy	scaly	GREY AND BLACK	dry and harsh	Germany	Pierre Ollaïre à gros graines. B. for furnaces.

T A L C.

GENUS VI.

COLUBRINE.

COLUBRINUS.

Composed of small, flat, thick, even, and close-connected Flakes.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. SOFT COLUBRINE.							
In flat masses	soft	light	uneven	OLIVE-COLOURED	very fatty	Salberg	for ornaments.
2. HARD COLUBRINE.							
Rude masses	very hard	heavy	rugged	IRON-GREY	fatty	Germany	for furnaces.
3. LOOSE COLUBRINE.							
Flat masses	hard	heavy	flaky	GREENISH	fatty	Salberg	for furnaces.

La Colubrine
tendre.
B.

La Colubrine
dure.
B.

Lapis Colubrinus
Lamellosus.
B.

ALL the Colubrines cut easily, but will take no polish.

If it were not for the last Species, it would have been hard to know the Colubrines were Talcs : but here we evidently see the plates ; though they will not separate.

In this, and in the Soaprocks, and the Potstones, all is Talc, though mixed and crushed together. These afford instances of Talc fouled with Earth ; but still 'tis talcy Earth ; and perhaps unformed Talc : and in the Ollaris, in particular, we see it in the most mixed state of all ; with unformed earthy Talc, and talcy Fibres.

T A L C.

G E N U S VII.

S E R P E N T I N E.

S E R P E N T I N U S.

Composed of Plates connected in small lumps, and mixed with unformed Talc.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. DARK SERPENTINE.							
In great lumps	very hard	very heavy	rugged	MARbled OF GREEN AND BLACK	dry	Finland	Talcum Serpentinus. L. for marble mor- tars.
2. BRIGHT SERPENTINE.							
In vast masses	hard	heavy	half-po- lished	MARbled OF DARK GREEN AND WHITE	fatty	Germany	La Serpentine demi transparent, B. for ornaments.
3. THREADY SERPENTINE. NEPHRITIC STONE.							
In large lumps	hard	very heavy	bright	LIGHT GREEN	fatty	America	Talcum Nephriticus. L. in medicine, for the gravel.
4. BLACK SERPENTINE. TOUCHSTONE.							
In vast rude masses	hard	heavy	smooth	BLACK	fatty	Silesia	Lapis Metallorum. W. for trying metals.

NATIVE FOSSILS.

CLASS II.

SELENITE.

SELENITES.

Composed of flexible, but not elastic Plates.

SELENITE is softer than Spar; less weighty, and somewhat less transparent.

Its Plates break into Rhombs; and when it crystallizes free and pure, this is its natural and original form.

We find it transparent, of various Figures; but composed all of united Rhombs: and when its concretion has been interrupted, we see it in the forms of granulated, fibrous, or scaly masses, and call them *Gypsa*, or *Plaster Stones*.

The substance is the same in all; for Selenite, like Spar, is but one thing, one substance; and whether we find it pure in beds of clay, or coating walls, or hanging in Icicles from the roofs of caverns; whether compact as marble, or loose as powder, still the substance is one: it proves the same on the severest trials; and when carefully disunited, and
E viewed

viewed before the microscope, its particles are all plated, watery, and rhombic.

Selenite therefore is one thing; one substance, in all its variety of forms: and 'tis but idle to divide its different appearances under the affected double terms of Species and Varieties. The laws of Botany cannot be justly extended to Fossils; because they are not organized bodies, or raised from seeds: in all its forms this is one thing; and the whole purpose here is to lay down its different appearances, for their disposition in a cabinet.

This Treatise is written for the arrangement of one great Collection; if it serves others, so much the better; but that is all its purpose.

We find even Arsenic in Selenites; nor did I ever see one without iron; and this, as more or less, causes a variety of forms: but still 'tis the one substance Selenite thus alter'd; and thrown, by means we know, into these appearances; and the term Species belongs to none of them: we use it for convenience of distinction; but must not dispute about its propriety.

ORIGIN of SELENITE.

SELENITE is composed of an Alkaline Earth, saturated with the Acid of Vitriol.

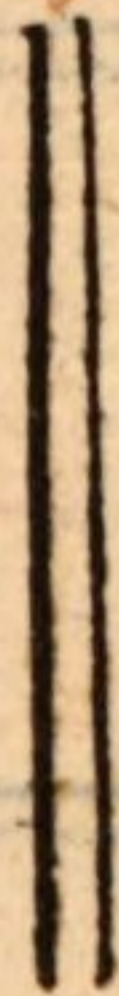
We know this: for we can make something very like it by art this way: 'tis pity we cannot do this exactly. We have its nature in these artificial bodies, but not its form. We can produce a Salt with all the properties of Selenite; and this, among the rest, that when well made, we can't again dissolve it: but I have never succeeded so far as to get this Salt in its Rhombic form: we have it in striated masses, and in clustered flakes; and in the same forms we have also natural Selenite. Art imitates the more imperfect and disturbed crystalizations of nature in this substance; and 'tis as much as we can expect from it; we cannot give the pure and perfect forms of nature.

Selenite will not strike fire with steel; for 'tis so soft, we crush it between the fingers: it will not ferment with acids, for 'tis a neutral Body in its nature; an earth capable of fermenting with them, but already saturated. Some kinds effervesce slightly, but 'tis from a mixture of Spar; for nature makes her saturations accurately. Cronstedt most justly talks of iron in some kinds; I find it, as already said, in all; nor is there any end of the variety of other mixtures.

Selenite falls into powder by a very slight heat: and, as 'tis said, may be dissolved and recrystallized. I hope it is so; but have not found the way to perfect it in my own trials. This powder hardens with water; but without heat, or what we call, flaking.

'Tis strange Wallerius should suppose the Selenite Bodies not to break into Rhombs: 'tis constant, and 'tis of their character; they differ in this from Talcs, whose flakes will never break into any form, tho' they will split for ever. They are simple; and are the very idea of mathematical extension, breadth without thickness.

SELENITI TESS.



ORDER I.

SELENITI TESS.

SELENITES RHOMBICUS.

In form of simple or united Rhombs, variously connected.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR SELENITE.							
Perfect clean Rhomb of ten fides	tender	light	polish'd	PELLUCID	clean edged	Oxfordshire, in clay	Natrum Selenites. L. for grottos.
2. WHITE SELENITE.							
Thick, rude Rhomb of ten fides.	hard	light	rugged	MILKY	scaly edged	Northamptonshire, in clay pits	Selenites Albus. W. a medicine for fluxes.
3. YELLOW SELENITE.							
A clean thin Rhomb of ten fides	very soft	heavy	polish'd	PALE YELLOW	shattery	Leicestershire	Selenites Flavus. W. for grottos.
4. MANY COLOUR'D SELENITE.							
A prism of fourteen fides	hard	heavy	rugged	WHITISH BROWN, WITH BLUE AND RUDDY VEINS	crackly, feather'd in the centre	Northamptonshire, in clay	Natrum Flexile. L. curiosity.

5. BASALTINE SELENITE.			Norway			curiosity.	Natrum Basaltinum. P.
A prism of six sides, with two pyramids	soft and tender	heavy	polished	DUSKY BROWN	full of cracks		
6. WEDGE SELENITE.			France			for scagliola.	Selenite Cuneiforme de Rome de Lisle.
An arrow head, form'd of two wedges	hard	light	glossy	WHITISH	sharp edged		
7. COMPLEX SELENITE.			Greenwich			for grottos.	Selenites Compositus.
A flat plate of Rhombs and Wedges	tender	heavy	polished	COLOUR- LESS	variously cracked		
8. GOLDEN SELENITE.			France			for scagliola.	Drusa Gypsea Flava.
A cluster of Wedges	soft	heavy	glossy	PALE YELLOW	shattery		

SELENI T E S.

ORDER II.

PLASTER SELENITE.

G Y P S U M.

Composed of numerous small Scales, irregularly laid together.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE PLAISTER STONE.							
A mass of thick scales	crumbly	very heavy	rough and coarse	DULL WHITE	hard particles	Germany	stucco work. Gypsum Micaceum Cronstedt.
2. GREY PLAISTER STONE.							
Masses of small scales	compact	heavy	rugged	SILVERY GREY	tender particles	Norway	stucco work. Gypsum Micaceum Griseum Cronstedt.
3. YELLOW PLAISTER STONE.							
Masses of thick scales	tender	heavy	uneven	YELLOWISH	small, soft particles	France	stucco work. Gypsum Micaceum Flavum Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. RUDDY PLAISTER STONE.							Gypsum Rubrum.
Vast masses of small scales	soft	very heavy	rugged	PALE RED	friable	Yorkshire	stucco work.
5. GLOSSY PLAISTER STONE.							Gypsum Pellucidum. W.
Bright masses of wav'd scales	friable	heavy	uneven	CLEAR	splitting	Germany	stucco work.
6. POWDER PLAISTER STONE.							Terra Gypseæ Cronstedt. W.
White dust	soft	light	granulate	WHITE	dry	Saxony	stucco work.

SELENITES.

F 2

ORDER III.

THREADY SELENITE.

GYPSUM STRIATUM.

Composed of long threads, laid one by another.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. WHITE THREADY SELENITE. ENGLISH TALC.							
Broad, fibrous masses	compact	very heavy	even	BRIGHT, BUT WHITISH	splits perpendi- cularly	Yorkshire	Gypsum Striatum. W. for cleaning lace and plate.
2. CLEAR THREADY SELENITE. In small masses	tender	heavy	polished	COLOUR, LESS	wavy	Sweden	Gypsum Fibrosum Cronstedt.
3. GREENISH THREADY SELENITE.							
Oblong masses	brittle	very heavy	rugged	PALE GREENISH WHITE PALE OLIVE- COLOUR'D	flaky	Germany	Le Gypse Scissile. W.
4. POLISHED THREADY SELENITE. Short, small masses	tough	heavy	smooth	PALE YELLOW	compact	Norway	Le Gypse Amianthe. W.
5. YELLOW THREADY SELENITE. Small clusters	tender	light	bright		filile easily	Sweden	Gypsum Capillare Cronstedt.

SELENITES.

R D E R IV.

RADIATED SELENITES.

G Y P S U M R A D I A T U M.

Formed into Rays, or Crests, or Ridges.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. STARRY SELENITE. CHEKAO.							Gypsum Stellatum.
Regular stars	very hard	very heavy	polish'd	PALE BROWN	lucid in the dark after in- solation	In China, and Island of Shepey, on the waxen vein	* for china ware.
2. WHITE COCKSCOMB SELENITE. PETUNSE.							Gypsum Crissatum Cronstedt.
Crusts on balls of Spar.	very hard	heavy	coarse	WHITE	irregular	Germany	* for china ware.
3. RUDDY COCKSCOMB SELENITE.							Gypsum Crissatum Rubrum Cronstedt.
Rude lumps	hard	very heavy	smooth	REDDISH	jagged	Sweden	

4. BONONIAN SELENITE.			Italy	Phosphorus Bononiensis. W.
Roundish lumps	hard	very heavy		
5. LIVER SELENITE.			Sweden	Lapis Hepaticus Cronstedt.
Coarse, scaly lumps	very hard	heavy		
6. BLACK SELENITE.			Sweden	Hepaticus Niger Cronstedt.
Small plated masses	hard	heavy		

* These, and the Soap Rock, seem the great ingredients of the China Porcelane; and we have them all.

SELENITES.

ORDER V. CURTAIN'D SELENITE.

SELENITES STIRIATA.

Coating the cracks of plaister pits, in form of folded curtains.

FORM.	HARDNESS	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE CURTAIN'D SELENITE.							
Vast sheets	hard	heavy	wav'd, and glossy	PURE WHITE	shattery	Italy	Stalactites Gypseus Albus Cronstedt. as alabaster.
2. YELLOW CURTAIN'D SELENITE.							
Great sheets	hard	heavy	polish'd	BROWNISH YELLOW	shattery	France	Stalactites Gypseus Flavus Cronstedt. as alabaster.

SELENITES.

ORDER VI.

STALACTICAL SELENITE.

SELENITES STALACTITIUS.

Hanging like Icicles from roofs of hollows.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR STALACTICAL SELENITE.							
Short cones	tender	heavy	rumpled, but glossy	COLOUR- LESS	brittle	Italy	Gypsum Spatofum Stalactium Cronstedt.
2. YELLOW STALACTICAL SELENITE.							
Long cones	hard	heavy	circled	YELLOWISH	very brittle	Sicily	Gypsum Spatofum Stalactium Flavum Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
3. WHITE STALACTICAL SELENITE. Rude lumps and rifings	tender	heavy	botryoide	WHITE	brittle	Sweden	Gypsum Spatosum Stalactium Album Cronstedt.

SELENI T E S.

ORDER VII.

STONY SELENITES.

SELENITES LAPIDEÆ.

In hard, solid, shapeless masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE STONY SELENITE. WHITE ALABASTER.							
Thick masses	tender	heavy	uneven	PURE WHITE	uniform texture	Ægypt	Gypsum Solidum. W. for ornaments.
2. BROWN STONY SELENITE.							
Rude lumps	hard	heavy	scaly	PALE BROWN	shattery	Sicily	Alabastrum Opacum Cronstedt. for ornaments.
3. YELLOW STONY SELENITE.							
Flat cakes	hard	very heavy	even	DULL YELLOW	shattery	Greece	Alabastrum Flavum Cronstedt. for ornaments.
4. AMBER STONY SELENITE.							
Great masses	hard	heavy	wav'd	AMBER- COLOUR'D	compact	Ægypt and Persia	Alabastrum Flavum Diaphanum Cronstedt. for ornaments.
5. GREEN STONY SELENITE. NEPHRITIC STONE.							
Great masses	hard	heavy	uneven	PALE GREEN, CLOUDED	greasy	America	Pierre Nephritique. W. a supposed medi- cine for the gravel.

FROM Selenite we naturally advance to Spar ; and enter upon one of the most intricate, and varied classes of the mineral kingdom.

Some general reflection ought to introduce a subject so important : and under an instance so commanding, and so explanatory of the rest, it may be proper to cast an eye upon the general course of nature, in the Fossil world.

When we have found the real origin of this pure Stone, we shall be led to that of half the concretes that we are about to examine : and when we have seen how this one substance assumes its various forms and colours, we shall judge easily of the rest. 'Tis not impossible to trace this accurately ; nor is any thing required to the undertaking but attention to the neighbouring Fossils where it is found ; and to the beds thro' which the level of the country, and construction of its strata will shew it must have run before concretion. This observation, carefully made, will give the Philosophic History of its varied appearances ; and lay them regularly down in a true natural method : but first we are to understand its origin ; and its place in the great chain of beings.

O F T H E
O R I G I N * of S P A R.

THE Series of Fossils make one great circle; for ever returning into itself.

There are a few primitive bodies; Chalk, Clay, Bitumen, Talc, and the Mineral Acid.

These, variously mixed, form many different compound Fossils: which mingling, in some places, farther with one another, give decompositions.

These (in other places) give up their several primitives again to water: which delivers them pure in some other parts; ready to form mixt and compound bodies again.

To trace them thro' these combinations, and to their natural analysis again, is the whole business of the Student in this science: for here is no distinction but by mixture: no origin from egg, or seed.

A great deal of pure Clay mixed with a little quantity of various Stones, forms the different Clays.

And a great deal of Stone with a little of the Clays, forms the various species of Stones.

* Published separately, July 1772, as a Specimen of a method of Fossils.

An instance of this course of nature appears in the philosophic History of Spar.

1. The primitives, as we have seen, are,
Water, Bitumen, Chalk, Clay, Talc, and Mineral Acid:
To these, the operations of the air, and fire give great powers of acting. We thus find
2. *Heavy Vapours*, form'd of air, and much water. These, pervading all things,
3. Meet the Mineral Acid ¹, and uniting with it; if they run clear to the surface, afford Medicinal springs; but
4. Thus united, they may fall upon Bitumen: this is no-where more frequent than in Limestone Rocks; and often stands in puddles, in their natural hollows ².
5. By this mixture, uniting in its course, is form'd a real, tho' a fluid Sulphur: for Sulphur is nothing else; nor can be form'd by any other means ³.
6. This Sulphur, not yet concreted, passes in its

¹ The Electric Æther of the under world; present every where, but only seen concentrated, or in its mixtures. It affects some things, Bitumen most: and avoids others.

² At Naples; in the Venetian Territories; and in Persia, this is very common.

³ Absolute Sulphur may be made by art with ease and certainty this way. The Acid of Vitriol, with any thing inflammable, affords it.

liquid,

liquid form, thro' the pores of the Limestone; dissolving part of its purer Chalk as it goes ⁴.

7. Water thus saturated with the principles of Sulphur, and with Chalk, keeps on its gradual course horizontally thro' the same Lime Rock, till it meets a fissure; a perpendicular crack, or opening; dividing one part of the rock from another. Here it ouzes forth: and meeting with a lighter air, hangs; and evaporates slowly.

8. Slow evaporation, and perfect rest, are the requisites of crystalization. The Sulphur and pure Chalk thus united, form one solid body; which crystalizing gradually, appears in regular rhomboidal particles; and is the substance we call Spar ⁵.

⁴ Limestone is only coloured, hardened Chalk; and Marble is the same. Marble is a purer Limestone, and Limestone a coarser Marble.

⁵ Spar supposed to be one thing, is therefore a mix'd body, and so are the purest Salts. We can make a substance of the nature of Spar, by crystalizing the lixivium of Lime and Sulphur.

NATIVE FOSSILS.

CLASS III.

SPAR.

SPATUM.

A pure Fossil ; composed of Brittle Rhombs.

SPAR is known from Talc by its want of elasticity ;

—from Selenite by its want of flexibility ;

—from Crystal by its dullness, and by fermenting with Acids.

It is heavier than any of the three other pellucid Fossils ; and is known from all bodies in the world (when pure enough to be seen through) by its doubling lines laid under ; and view'd through it.

This last property has been supposed peculiar to that species of Spar call'd Island Crystal : and the greatest writers, Linnæus, Wallerius, Cronstedt, and the long *et cætera*, have separated that body from the pure Rhombic Spar ; which they supposed not to have the double refraction. But this power resides in all Spar I have examined : and is of its nature : as it arises from the internal construction of the body, which is made up of smaller Rhombs, apply'd one to another.

The

The very atoms of Spar are Rhombic ; and those smallest pieces into which it may be separated by gentle Acids, without solution, apply'd to the microscope over a line proportionably fine, have the same power.

No body has this construction except Spar ; therefore no other natural or artificial substance has this power of double refraction. Even Sir Isaac Newton has said, Crystal has something of this power ; in vain : for no authority can stand against the testimony of the senses. All different mediums vary in refraction ; but this peculiar power resides only in a pellucid body formed of connected Rhombs.

The state of refraction in the pellucid natural bodies is this,

1. Talc in thick masses elevates the line.
2. Selenite waves it.
3. Crystal distorts it.
4. Spar gives it double.

All Spar does this, even that which takes the form of Crystal, in Pyramids, and Columns : therefore even the variously angulated forms of Spar are composed of Rhombs ; and the construction of Spar, and of Crystal, are perfectly different, even while their forms are the same.

Spar is seldom found original, and free : a few pure Rhombs ;

Rhombs; and two Columns, double pointed, which were dug in the Hartz Forest; are all I have of it.

Nature has mixed its particles among the matter of the Marbles and Limestones; from whence it is washed forth by the pervading water, and left slowly by it, in their cracks and fissures; where it assumes these various forms:

1. Pure Rhombs of a larger size.

2. Rude masses, form'd of coarse connected Rhombs.

3. Plates composed of connected Rhombs.

4. Columnar, Pyramidal, and Cubic Figures, fix'd upon the surface of these rude masses.

In this latter case the rude mass continues uncolour'd, and is the Root; and the Columnar or Pyramidal Figures rise from it frequently yellow, often of other colours: these cut into a kind of Gems, but still have the double refraction equally with that part we call the Root.

5. Icicles and Dropstones.

That the Spar form'd in fissures of rocks, is thus wash'd out of the Limestone itself is certain;

Because none but Limestone Rocks have Spar in their fissures; Rocks of a crystalline matter, or form'd of vitrifiable Stone, have Crystal; never Spar in their cracks.

Linnæus wonders at the nature of that force which split the Rocks into these cracks : but probably the cause is very familiar ; they were formed moist, and crack'd in drying.

Spar grows continually ; for wheresoever there is a crack in a Limestone Rock, new, or old ; Spar always fills it ; and over-runs the surface.

Letters cut hollow in a living Rock of Limestone, fill up, in a course of years, with Spar ; and what were made in Creux are found in Relief. This has been seen in Gothland by the eminent Swede ; and in the grotto of Antiparos by Tournefort. The very time may be determined by the dates, which are often a part of the inscription ; but it is always long. The Spar stands higher as the time is more distant : and has been seen in some places a quarter of an inch above the level of the surface.

If there could want a proof of the continual growth of Spar, the Stalactites would shew it ; and the incrustations, in what are called our petrifying springs ; but that is a fouler sort : there is in Norway a pyramid of Spar two inches long, which was once mine ; in which two branches of the solid Heath moss, or Lichen, are perfectly embodied.

It has been thought the Spar in cracks of Rocks was brought from elsewhere by water ; or was and is originally in all water : the latter is the opinion of Linnæus ;

Linnaeus; Henkell maintains the former. But if either were the case, Spar would be sometimes found in Vitrescent Rocks, and Cryстал in those of Limestone; which observation denies.

Spar they say will be formed where water can be retain'd; but indeed also where it cannot; 'tis enough that it ouzes slowly: nay, not water alone dissolves Spar; but it can be retain'd in vapour. I have from Cornwall incrustations of true Stalactite, form'd in the pipes of fire engines in the mines, at heights to which the water never ascends, by many feet; but only vapour.

Mundick is also thus a creature of the air, in many places. I have trigonal pyramids of Spar, which hung from the top of the Bauman's Cave, in the Hartz, covered with Cubic Mundick; there is none in the Spar itself; and from the particular circumstances of the specimen, water could not have lodg'd upon it, only vapour.

Spar is one thing, of one weight, one hardness, and when pure can never be mistaken for any other Fossil. It is liable to have other bodies mixt with it; and to be altered in its condition by that mixture: but 'tis itself the same. Wallerius distinguishes three degrees of hardness in this Fossil; but they are owing to those mixtures; the least hard is the true condition of Spar; the other degrees arise from iron, or other additions.

It is the opinion of Linnæus, that Spar owes its angulated form to Sea Salt; and the Cryftals to other Salts: but there is no warrant in nature for this judgement. Salts are acrid, and dissolve in water. These Fossils have neither of those qualities: and who shall tell us that the property of forming itself into regularly angulated Figures is peculiar to Salts? We have no authority to believe it is wanting in Cryftal, and Spar; and we have the evidence of our senses that they have it.

The ingenious and ingenuous Croustedt well observes, these Figures ought not to be ascribed to Salts, till the presence of such Salts can be prov'd in them.

The calcarious nature of Spar is of its essence; and no form, nor all the other characters in the world, could constitute a thing a Spar, that wanted this. They all ferment with Acids, and they burn to Lime: nor is this latter quality equivocal, as some would think, because by the fire of a great burning glass, Spar vitrifies. This is not the fire, when we speak of Lime; and it can be a test of nothing; because all things vitrify before it: that is the extream force of fire: and the ultimate effect of fire on all bodies is vitrification.

Linnæus says, the Spar he calls Natro-spatosum, scarce does effervesce with Acids: and it may be added, that the particles of that Spar are scarcely at all Rhombic: Spar and Cryftal are mixt in those bodies;

and they have mixt qualities ; but still as there is some Spar, there is some Effervescence.

'Tis vain to give the forms of Spar to Natrum; for we not only find no Natrum there, but different Spars have forms of different Salts ; and the great patron of the Salt System allows, that some of them affect the various angulated Figures of Alum, Sea Salt, Vitriol, and the rest. 'Tis true, they resemble those forms ; but they have not those forms exactly : nor is either of these, or any other Salt whatever, to be found existing in any of them.

But whither will not the wind of Theory blow even the steadiest judgements : the foremost of the writers, who favour this System, because there are in Spars certain forms that do not agree with those of any known Salt, fancies for the formation of these that there exist Salts, not otherwise known to us, but by this operation. When Theory can reach this heighth, it may do what it pleases : to create Causes, because we see Effects that seem to us to require them, is to make all things easy ; and at the cheapest rate.

If we can ever bring Spar, after solution, to recrytallize, as Salt ; we shall see all things explained in this particular. 'Tis what I have try'd four years, with poor success ; and I have now requested the ablest chymist that we have, to join with me in the attempt. What may arise under his experienced hand, I know not : all I have found is, that the swifter the fluid is evaporated,

porated, the coarser is the matter left behind ; and the more length of time is given, the nearer it approaches to a promise of Crystals.

I think when this shall be accomplish'd, we shall find all Spar to be but one thing ; differing only according to the other matters mixed with it. 'Tis said, the Selenite powder'd and mixt in water, affords Crystals ; and Kahler gives the authority of an eminent metallurgist for it : with me neither has this succeeded yet : but I have no despair ; and tho' it never should succeed with me, it may with others : when that is seen, the other, more important as it is, need not be supposed impossible.

Nothing is more familiar than the production of what it is the custom to call, Selenitical Salts ; Urine affords them ; and some preparations of Sulphur ; but to recrystallize Selenite is, to produce, from a clear fluid, pellucid dodecahedral Rhombs, flexile, not elastic, and not soluble again in water : and he who shall effect this, need not despair of recrystallizing also Spar.

The Salts in Urine that has stood long come nearer the nature of Fossils than any thing we know ; and Tartar, form'd from Wine, is very difficult of solution : yet both these may be melted in pure water. The Salt produced by slow crystallization from a Lixivium of Lime and Sulphur, comes nearest of all to Spar ; but still it is but an approach ; and not a same-

ness : as he who is well acquainted with all the qualities of the vitriolated Tartar will perceive : nor do I conceive Henkel's receipt, form'd on the same foundation, would go any farther : but till men speak plain, 'tis vain to war against their buried meaning.

In fine the formation of Spar is yet a subject of enquiry : its atoms are all Spar ; each particle into which we can without violence divide it, is the same in all respects as the whole : and as the Fossil world admits no generation, or birth, by egg, or seed, it seems most probable that all the variety of forms in which we see this Protean Mineral, are owing to no cause beside the arrangement of Rhombs into as many forms as they are capable of producing. It fills the cracks of its own rocks : and of no other : for Crystal Columns rise from crystalline Rocks ; and from Metallic Masses, fractur'd, grow Pyritæ ; each separated from the great mixt body we see split ; and each form'd into Figures by its own laws, without the intervention of Salt, or other matter.

We find hollow Crystals, and we have hollow Pyramids of Spar ; but 'tis a rash thought, tho' of a great man, to imagine that a Crystal of Salt was first form'd in these cases ; and when the stony coat was finished over, it melted away again : this is imagination : but there is not a hollow Stalactite that may not shew the senses, and convince the reason, that this shell of Spar, or Crystal, may be form'd without a solid nucleus.

There

There are no entire Rocks of Spar; and they who thought they had seen such of Crystal, perhaps mistook pure Ice for them. Both Spar and Crystal rise in general from foul Stones; and they who thought Ice grew to them in time, were scarce more pardonable than such as took Ice for them. Scheukzer has seen the difficulty of accounting for their forms, and joined the lamentation of Philosophers upon that subject; for the Salt System was not then in being: but the old Pliny has not only lamented this difficulty, but assigned its cause; and this a cause to overthrow that system utterly: it is, that tho' the Figures be all regular, they are not all alike; or all resolvable into the same laws.

'Tis an invidious office, and unpleasing, to dwell upon the errors of those who wrote before; but these are so receiv'd, and so establish'd, that there is no other way to truth.

Wallerius says, that Spar is composed of Rhombic and Pyramidal particles: and therefore breaks into both these forms. It is unwillingly I dissent in a few particulars, from an author with whom reason and observation command me to agree in a great many: but this is a doctrine which strikes at the root of all accurate knowledge in respect of this body.

By this account Spar would be two things, not one: its atoms would have two Figures; and we should lose the great distinction by which it is kept
separate

separate from all other bodies. I have examined this point with all possible attention ; and find the pyramidal Figures of Spar, whether in greater or smaller pieces, to be a secondary form ; composed always of Rhombs : but the Rhombic Figure never to have any form in its constituent parts beside its own. The Pyramids, great or small, separate into Rhombs ; the Rhombs never into Pyramids. The true way of dividing Spar is, by an Acid, carefully manag'd ; for the parts are always separated, before they are dissolved.

It is a singular and a just observation of the same author, that no pentagonal Spar has ever been found ; tho' angles in most other numbers are frequent ; but this is not to be attributed with him, to an imaginary Salt, Alcaline, and Muriatic ; it rests upon a much more solid base : which is, that the particular Figure of the Rhombs of Spar, admit the constructing any other angulated form, only not pentagonal.

It has been said, that Island Crystal shines in the dark after it has been calcin'd in manner of the Bolonian Stone ; but this is not particular to that Species : it is the quality of all Spar, as Spar ; only there requires great nicety in the calcination : perhaps Selenite also has this power. Linnæus refers the Bolonian Stone to Spars : to me it has appear'd rather a Selenite ; and of all bodies in nature, most of kin to that species of Selenite we call the Star, upon the waxen vein. I have therefore retain'd it in that place, till more of this scarce Fossil comes in my way for trial : if
it

it prove Spar, 'tis easily removed into that Class; and thus, and only thus, we can arrive at truth; after a thousand errors.

That the Hog Spar affords Flowers on sublimation, has been urged as a great proof of its containing Salts of some kind or other; known or unknown: but surely this property is more naturally resolved into another source. All Bitumens yield flowers on sublimation; and we have the testimony of our senses to the presence of a Bitumen in the Lapis Suillus: it stinks of it. Nay more, there is a smell of Sulphur in all Spar, when calcined: Henkel and Wallerius, as well as I, have found it; and if we could give way to any thought of secondary forms, in a Fossil whose construction appears perfectly homogeneous, and simple, my sense of it would be, not to seek them in imaginary Salts, but real Sulphur.

We see the way art imitates it best, is by the Crystals of a liquor in which Lime and Sulphur have been boil'd. Sulphur is thus disclosed on the calcining of Spar; and for the other ingredient, Lime, we cannot be at a loss; since it has been observed, no Spar is ever produced in cracks of any rocks, except those of Limestone: nay, and what may strengthen this opinion, the Lime of Spar is weaker than that of Limestone, which, a little Sulphur may cause. All this, is but conjecture; and is delivered as such, and no other; but yet it rests on the testimonies of the senses; not on the flights of the imagination: and it is by conjecture,

ture, in these dark and difficult researches, we must arrive at truth.

I claim no better authority for many of the particular observations here, than for this general one; they are indeed all founded on examination, and experiments, now made on the occasion; but they are examinations and experiments made only on the bodies in my own scanty store: I invite, I solicit, and entreat with my best earnestness, others to repeat them on their own. If they answer as in mine, the doctrines are establish'd; if they differ, there is no one in the world to whom that truth will be more welcome than to myself. To equivocate about an error, is pitiful; to attempt to justify it, is disingenuous: no man should be ashamed of setting right his own mistakes (especially in matters where mistakes are unavoidable) whether by his own or others observation. With how many hundred errors did the *Species Plantarum* make its first appearance; how many of them have been rectify'd; and how many yet remain to be set right? Yet no one ever blamed Linnæus for his first conjectures; nor has the world seen any other book of Science of equal value.

Such errors are the children of imperfect information; and must be found in all who attempt to write for general utility.

Let others therefore freely repeat these my experiments, and add more of their own; and with
an

an honest freedom tell the result of all. My single attention can only make a few experiments, where true knowledge demands a thousand : but the result of different trials will bring forth truth.

It never was more needed in Philosophy than in the part before us ; for with all the plausibility of system, we cannot but perceive upon this free and fair enquiry, that the Student in Fossils has yet to work upon a chaos : and that the paths into a better light, are stop'd and clos'd up utterly : not by ignorance ; but what is much worse, by authenticated error ; authenticated even by greatest names. We must unwind this Charm, if ever we hope to gain the right clue to lead us thro' the labyrinth of nature : we must break the fated Talisman ; and all the seemingly impregnable structures will vanish : the ground will be clear before us ; and if we lose ourselves in the open way, 'tis easy to be set right again.

SPAR form'd by nature, as above related, may either concrete in its pure state as soon as made ; or it may pass while yet fluid, thro' various strata of Earthy, Saline, Mineral, and other matter, and receive great changes both in form and colour from them : it may appear to us therefore, according to these circumstances, either

- in its own pure state of a colourless Rhomb ;
- or foul'd by earths ; or ting'd by metals ;
- or plated, by an admixture of Talc ;
- or render'd cubic by the natrane Marle ; and those cubes stain'd to a mimickry of Gems by metals ;

or it may be shap'd into Polygons by an aluminous earth ;

or thrown into Pyramids, with or without Columns, by the Salts of Mineral Waters :

Or from the mere nature of its concretion, it may appear as curtains spread upon a wall ;

as Icicles hanging from a roof ;

or Globules drop'd upon the floor ;

or as a coat upon mosses, or shells, or various other matters.

According to these accidents it may be thrown into a kind of method, under the terms Genus and Species, to great advantage. The obvious Characters giving an artificial method ; and the consideration of their Origin a natural one.

S P A R.

O R D E R I.

Retaining its natural Figure.

G E N U S I.

P U R E S P A R.

R H O M B I T E S.

Spar in form of Rhombs.

This is either pure as it concretes alone; or variously stain'd and colour'd by admixtures.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. SOFT SPAR.							
Small Rhombs	tender	very heavy	glossy	COLOUR- LESS.	soft	Hartz forest	Rhomboites Pellucida. N. a delicate, but weak lime. Spatum Speculare Duplicans. L.
2. ICELAND SPAR.							
Large Rhombs	friable	heavy	glossy	COLOUR- LESS.	smooth	Iceland, Switzer- land, &c.	double refraction. Spatum Compactum. L.
3. MILKY SPAR.							
Irregular Rhombs	brittle	very heavy	dull	MILKY WHITE	rugged	Derbyshire	lime. Spatum Speculare Flavescent. L.
4. TOPAZ SPAR.							
Connected Rhombs	hard	very heavy	crystalline	PALE YELLOW	fatty	Germany	false gem.

5. GARNET SPAR.									Spatum Rubrum Compactum. L.
Confus'd Rhombs	soft	heavy	dull	STRONG RED.	uneven	Yorkshire			
6. EMERALD SPAR.									Spatum Speculare Virefcens.
Small Rhombs	hard	heavy	bright	GREEN	soft to the touch	Germany	false gem.		
7. SAPPHIRE SPAR.									Spatum Speculare Cerulefcens. L.
United Rhombs	very hard	heavy	perfectly polished	PALE BLUE	dry	Germany	false gem.		
8. OPALINE SPAR.									Rhombites Opalina. N.
Connected Rhombs	brittle	very heavy	clouded	CHANGE- ABLE GREY	soft	Brazils	false gem.		
9. YELLOW RHOMBIC SPAR.									Spatum Compactum Flavescens. L.
Rude maffes breaking in Rhombs.	friable	heavy	fcaly	DULL YELLOW	glimmer- ing.	Norway, England	lime.		

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
10. BLUE GREEN RHOMBIC SPAR.							
Rough Lumps	shattery	light	cracky	POOR GREEN	wavy	Germany	lime. Spatum Compactum Virefcens. L.
11. ORANGE SPAR.							
Large Rhombs	shattery	heavy	crackled	ORANGE COLOUR	streaky	Germany	lime. Rhombites Aurantiaca. N.
12. BROWN RHOMBIC SPAR.							
Great rude Lumps	shattery	heavy	irregular, flaky	LIGHT BROWN	harsh	England	lime. Alumena Quartzosum. L.
13. BLACK RHOMBIC SPAR.							
Small con- nected Rhombs	very hard	very heavy	scaly	BLACKISH	hard	Cornwall	a tin ore Le Spath Cubique Noiratre. W.

S P A R.

ORDER II.

Affecting the Figure of Talc.

G E N U S I.

P L A T E D S P A R.

P A R O P S I S.

Spar formed into broad, flat Flakes.

Spar assumes this Figure after passing thro' beds of Talc.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR FLAKY SPAR.							
Irregular, large flakes	brittle	light	glossy	COLOUR- LESS	unequal	Norway	for windows.
2. WHITE FLAKY SPAR.							
Uneven cakes	very brittle	heavy	rough	MILKY	harsh	Sweden	lime.
3. WAVY SPAR.							
Flat cakes	brittle	light	undulated	GREY	fatty	Denmark	lime.

1. CLEAR FLAKY SPAR.

Irregular,
large flakes

brittle

light

glossy

COLOUR-
LESS

unequal

Norway

for windows.

2. WHITE FLAKY SPAR.

Uneven
cakes

very brittle

heavy

rough

MILKY

harsh

Sweden

lime.

3. WAVY SPAR.

Flat cakes

brittle

light

undulated

GREY

fatty

Denmark

lime.

Spatum
Fissile.
L.Spatum Aqueum
Hartenfe.
W.Spatum
Undatum.
L.

S P A R.

O R D E R III.

Affecting the Figures of the Crystals.

F L U O R E S.

G E N U S I.

T W O - P O I N T E D S P A R.

FLUOR BICUSPIDATUS.

Composed of two hexagonal Pyramids, with an intermediate hexagonal Column.

FORM.	HARDNESS,	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. SALBERG SPAR.							
Small	soft	very heavy	polish'd	COLOUR LESS	Bituminous	the Salberg hills in Asbestos	curiosity.
2. TAWNY SPAR.							
Large	hard	heavy	uneven	YELLOWISH	bituminous	the Swedish iron mines	curiosity.

Fluor Bicuspidatus
Diaphanus.
W.

Fluor Bicuspidatus
Martialis.

SPAR.

ORDER III.

GENUS II.

CONNECTED SPAR.

FLUOR CONNEXUS.

Composed of two trigonal Pyramids, without any intermediate Columns.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. DIAMOND SPAR.							
Small	hard	very heavy	polish'd	PERFECTLY CLEAR	smooth	Ramel- sberg	curiosity. Dent des Cochons a deux Pointes, W.

SPAR.

ORDER III.

GENUS III.

COLUMNAR SPAR.

FLUOR COLUMNARIS.

Composed of a Column, terminated by a Pyramid.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. HEXAGONAL SPAR.							
Long sprigs	tender	heavy	glossy	WHITISH	flaky	Derbyshire	Spatum Cryſtalliſatum Hexangulare. W.
2. TETRAGONAL SPAR.							
Thick ſprigs	hard	very heavy	flaky	YELLOWISH	rough	Yorkſhire, lead mines	lime. Fluor Columnaris Tetragonus. N.
3. TRIGONAL SPAR.							
Short ſprigs	ſoft	heavy	ſcaly	RUDDY	uneven	foreſt of Dean	Fluor Columnaris Trigonus. an iron ore.

S P A R.

O R D E R III.

G E N U S IV.
P R I S M A T I C S P A R.

F L U O R P R I S M A T I C U S.

In form of an angulated Column, without a Pyramid.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR	QUALITIES.	PLACE.	USES.
I. SIX-SIDED SPAR.							
Coarse shoots	tender	heavy	rugged	BROWNISH	friable	Lancashire	lime. Spatum Prismaticum Hexangulare. W.
2. ABRUPT SPAR.							
Also short pieces.	hard	very heavy	smooth	RUDDY	confus'd together	Sweden	lime. * Spatum Prismaticum Truncatum. W.
3. MANY-SIDED SPAR.							
Short sprigs of fourteen fides	very hard	heavy	glossy	YELLOWISH	uneven	Derbyshire, lead mines	lime. Spatum Crystallinum Tetradeca hædum. W.

* Wallerius saw this six sided : all my pieces are very ill determin'd in this article, breaking ill from the mass.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. POLYGONAL SPAR *.							
A broad base and fourteen fides	hard	heavy	polish'd	YELLOWISH	in great clusters	Cornwall	Fluor Pyramidalis Polygonus. a flux for ores.
2. ELEVEN EDG'D SPAR.							
Short	tender	very heavy	glossy	RUDDY	cluster'd	iron mines in the Hartz	Spatum Pyramidale Endeca-hædrum. W. an iron ore.
3. EIGHT SIDED SPAR.							
Irregular masses	very hard	heavy	polish'd in some parts	YELLOWISH	clustery	lead mines, Derbyshire	Spatum Pyramidale Octa-hædrum. W. lime.

* This seems the other half of the preceding Species, but always separate.

S P A R.



O R D E R III.

G E N U S VI.

O B L I Q U E S P A R.

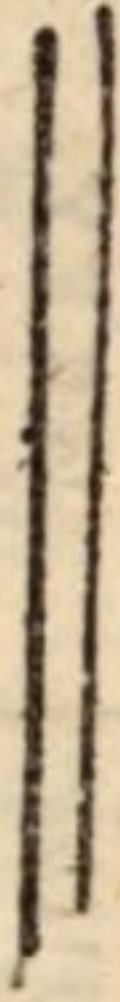
S U I L L U S.

In form of cluster'd Prisms, cut off obliquely at the top.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BROWN OBLIQUE SPAR.							
Uneven clusters	tender	heavy	polished	DARK BROWN	stinking when rub'd	Germany, and Norway	Lapis Suillus Prismaticus. W. a flux for ores.
2. RADIATED OBLIQUE SPAR.							
Uneven masses	soft	heavy	unequal	GREY	very stinking	Denmark	Lapis Suillus Radiatus. W. curiosity.
3. GLOBULAR OBLIQUE SPAR.							
Rounded masses	hard	heavy	botryoide	BRIGHT BROWN	sulphure- ous when struck	Norway	Lapis Suillus Sphericus. W. lime.

The Colour, as well as scent of these Spars, goes off in the fire: they require but a slight heat to render them as white and sweet as the other Spars: nor is it wonderful that sulphur should predominate so much in one kind, more than others. But 'tis singular, that the form of these Species is their own, and is indeed a certain Generic character; and that the abundant sulphur always attends it.

S P A R.



O R D E R IV.

C U B I C.

D R U S Æ.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR CUBIC SPAR.							
In great complex clusters	soft	heavy	polished	COLOUR- LESS	multi- tudes mix'd to- gether rudely	Derbyshire	Spatum Crystallizatum Cubicum. W. lime.
2. BROWN CUBIC SPAR.							
In thick clusters	hard	heavy	smooth	YELLOWISH BROWN	confus'd in clusters	Cornwall	Drusa Fusca. a flux for ores.
3. PURE WHITE CUBIC SPAR.							
Small and distinct	soft	very heavy	glossy	PERFECTLY WHITE	loose and free	Gloucester- shire, in iron mines	Drusa Lactea. curiosity.
4. GREY CUBIC SPAR.							
Small clusters	hard	heavy	scaly	GREY	connect- ed, but not confus'd	Germany, in iron rocks	Drusa Grisea. a flux.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. TAWNY CUBIC SPAR. In great con- fus'd masses	brittle	very heavy	rugged	YELLOWISH BROWN.	confus'd clusters	Forest of Dean	a flux. Drusa Fulva.
6. PURPLE CUBIC SPAR. Small, and single	very hard	heavy	polish'd	AMETHY- STINE	distinct and perfect	Norway	curiosity. Drusa Amethystina.
7. RED CUBIC SPAR. Separate cubes	hard	very heavy	glossy	FINE RED	pure and free	Spain	a gem. Drusa Rubescens.
8. BLUE CUBIC SPAR. Loose clusters	tender	very heavy	polish'd	BRIGHT BLUE	connect- ed, not confus'd	North America, in copper mines	a false gem. Drusa Cerulea.

9. DEEP-GREEN CUBIC SPAR.			scaly	DEEP GREEN	small masses	Sweden	Drusa Viridis. a flux.
Small clusters	soft	heavy					
10. PURPLE CUBIC SPAR.			flaky	DEEP PURPLE	single	Germany	Drusa Violacea. a flux.
Distinct	soft	heavy					
11. AQUA MARINE CUBIC SPAR.			glossy	BLUE GREEN	distinct, tho' con- nected	Hartzforest	Drusa Cæruleo Virens. a flux for ores.
Small clusters	tender	heavy					
12. EMERALD CUBIC SPAR.			polished	PERFECT FINE GREEN	connected	Norberg	Drusa Smaragdina. a flux for metals.
Large clusters	hard	very heavy					

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. LEMON CUBIC SPAR.							
Vast masses	very soft	heavy	scaly	PALE, BUT DEAD YELLOW	confused	the Hartz	Drusa Pallefcens. a flux for ores.
14. VIOLET CUBIC SPAR.							
Distinct, and small	hard	heavy	polished	VIOLET COLOUR'D	scarce connected	Gilsoff	Drusa Violacea. a false gem.
15. BLACK CUBIC SPAR.							
In large clusters	very hard	very heavy	glossy	BLACK	connect- ed, not confused	France, where there is TIN	Drusa Nigra. curiosity.
16. DEEP-GREY CUBIC SPAR.							
Small clusters	soft	heavy	polished	DEEP GREY	confused	Cornwall	Drusa Griseofusca, a flux.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. BLUE-GREY CUBIC SPAR.							
Small clusters	hard	very heavy	glossy, but flaky	BLUE GREY	connected	Sandfwaer, in Norway	a flux. Drufa Subcaerulea.
18. GARNET CUBIC SPAR.							
Loose and free	soft	heavy	polished	FINE RED	scarce connected	Alface	a false gem. Drufa Rufa.
19. RUBY CUBIC SPAR.							
Small clusters	hard	very heavy	glossy	BRIGHT RED	almost free	Schemnitz	a false gem. Drufa Rubea.

SPAR.

ORDER V.

A N D R O D A M A N D E S P A R .

A N D R O D A M A S .

Oblong, and affecting the paralleloiped Figure.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE ANDRODAMANDE.							
In large masses	very soft	heavy	polish'd	CHALKY	brittle	Sneeberg	lime. Androdama Alba.
2. YELLOW ANDRODAMANDE.							
Vast masses	tender	heavy	flaky	DULL YELLOW	shattery	America	lime. Spatum Pellucidum Flavescens. W.
3. TAWNY ANDRODAMANDE.							
Great masses	soft	very heavy	glossy	BROWNISH YELLOW	brittle	Anderasberg, in Germany	a good flux. Spatum Pellucidum Croceum. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. BLACK ANDRODAMANDE.							
Small clusters	hard	very heavy	glossy	DEEP BLACK	brittle	Goffelaer, in Saxony	a tin ore. Spatum Pellucidum Nigricans. W.
5. GREEN ANDRODAMANDE.							
Small clusters	soft	heavy	polished	FINE GREEN	brittle	Switzerland	a false gem. Androdamas Smaragdinu Scheukz.
6. MARBLED ANDRODAMANDE.							
Great masses	hard	very heavy	veiny	YELLOW, VEIN'D WITH RED AND BROWN	brittle	Switzerland	lime. Spatum Pellucidum Venosum. W.

S P A R.

O R D E R VI.

I R R E G U L A R S P A R S.

S P A T U M E F F L O R E S C E N S.

Uncertain in its Angles, but throwing itself into complex elegant Forms.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. ROSE SPAR.							
Large rose-like masses	tender	heavy	flaky	DEAD WHITE	hollow	Sweden, in lead mines	Spath Cryſtalifée en Roſes. W. a flux.
2. HEDGE HOG SPAR.							
Small masses	hard	light	unequal	GREYISH	convex	Italy	Spati Echinorum Imperati. curioſity.
3. LAMELLATE SPAR.							
In vaſt flattened masses	hard	heavy	gill'd like muſh-rooms	WHITE	lightly convex	Germany	Spatum Plexum Tetradeceahædram. W. lime.
4. BROKEN SPAR.							
Great lumps	very hard	heavy	ſmooth	BROWNISH	form'd of half octagons	Sweden	Spatum Dimidiatum. W. a flux.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
5. DECUMBENT GRAPE SPAR.							
Large clusters	soft	heavy	glossy, but rising in lumps	PALE BROWN	brittle	Sax Weiffenfels, in Norway	lime. Spatum Botryticum. W.
6. CYLINDRIC SPAR.							
Great masses	soft	very heavy	glossy	PALE YELLOWISH	brittle	Bisbjerg, in Sweden	lime. Spatum Crystallifatum Cylindricum. W.
7. GLOBULAR SPAR.							
Round lumps	hard	heavy	smooth	BROWNISH	firm	Hartz forest	lime. Spatum Crystallifum Globosum. W.

S P A R.

ORDER VII.

DEBASED SPAR.

SPATHURA.

Alter'd in its aspect and qualities by a mixture of other matters.

GENUS I.

SAND SPAR.

SPATHURA ARENACEA.

Granulated irregularly, and having an aspect of lumps of Sand.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE SAND SPAR.							
Rude masses	brittle	heavy	uneven, and irregular	GREYISH WHITE	composed of various siz'd particles	Twyebrook, in Sweden	Spatum Arenaceum Album. W. a flux.
2. YELLOW SAND SPAR.							
Small clumps	shattery	heavy	uneven	BROWNISH, YELLOW, AND GREY	confused, and coarse	Germany	Spatum Arenaceum Cinereum. W. a flux.
3. RUDDY SAND SPAR.							
Rough lumps	very hard	very heavy	uneven, and rough	DEEP RED	irregularly mixed	Forest of Dean	Spatum Arenaceum Rubrum. W. a flux.

SPAR.

ORDER VI.

GENUS II.

GLASS SPAR.

SPATHURAVITREA.

Glassy, firm, solid, and shapeless.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR GLASS SPAR.							
Large nodules	very hard	heavy	uneven, but glossy	COLOUR-LESS	breaking into rude cubes	Stalberg	curiosity.
2. GREY GLASS SPAR.							
Rude Lumps	very hard	heavy	polish'd, but uneven	GREYISH WHITE	breaks in angulated fragments.	Hartz forest	curiosity.

Spatum
Scintillans.
L.

Spatum Lateribus
Nitidis.
W.

SPAR.

ORDER VI.

GENUS III.

PYRITIC SPAR.

SPATHURA PYRIMICHA.

Irregular, botryoide, and striated.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. RUDDY PYRITIC SPAR.							
Oblong lumps	brittle	very heavy	raised in bumps	RUDDY BROWN	sulphureous, when broken	Forest of Dean	Spatum Pyrimachum Rubrum. W. curiosity.

All the debased Spars have more or less of various mixtures in them, and therefore manifest their characters as Spar, less freely; but there is always more or less of the calcarious quality in them; and when broken, if not while whole, they shew somewhat of the cubic form in their particles.

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VII.

CURTAIN'D SPAR.

STIRIA.

Hanging over the walls of caverns in form of folded curtains.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE CURTAIN'D SPAR.							
Vast sheets	brittle	heavy	polished, and glittering	COLOUR- LESS	flaky, when broken	Grotto of Antiparos	for slabs and or- naments.
2. YELLOW CURTAIN'D SPAR. ORIENTAL ALABASTER.							
Wav'd sheets	tender	heavy	polished, and undulated	PALE YELLOW, VARIOUSLY VEIN'D	breaks in freaky flakes	Ægypt; also Cornwall	for ornaments.

Stiria
Decolor.Stiria
Flavescens.

3. PURPLE CURTAIN'D SPAR.
ROOT OF AMETHYST.

Stiria
Amethystina.

4

Thick coats	hard	heavy	uneven, but glossy	GREY, BLOTCH'D WITH PUR- PLE, OR OTHER COLOURS	breaks unevenly, and crackly	Derbyshire	for ornaments.
4. WATER SPAR.							
In crufts in tea-kettles	brittle	light	uneven, and rough	DIRTY GREY	striated	every where	none.
5. AERIAL SPAR.							
Fine coats	hard	heavy	smooth, and even	BROWNISH YELLOW	striated, when broken	in the pipes of fire en- gines in the Cornish mines where only vapour comes	curiosity.

Stiria
Fulca.

Stiria
Aeria.

S P A R.

ORDER VIII.

STALACTITICAL SPAR.

STALACTITES.

In form of Icicles hanging from the roofs of caverns.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE STALACTITE.							
Long cones	brittle	heavy	uneven, but polished	WHITISH	flaky, when broken	roofs of ca- verns, Anti- paros, and Derbyshire	Stalactites Albus. an ornament for grottos.
2. GREY STALACTITE.							
Thick cones	hard	heavy	rumpled, and uneven	GREYISH	shattery	limestone caverns, Derbyshire	Stalactites Griseus, W. for grotto work.
3. CHALKY STALACTITE.							
Coarse cones	soft	light	wav'd, and rumpled	PURE WHITE	dufty, when broken	vaults and arches, Windfor,&c.	Stalactites Cretaceus. for grottos.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. RED STALACTITE.							
Short cones	brittle	very heavy	wav'd	RED	irregular, when broken	Derbyshire	Stalactites Ruber. W.
5. BLACK STALACTITE.							
Slender cones	very hard	heavy	rumpled	DEEP BLACK	flaky, when broken	Grapenberg, in Sweden	Stalactites Niger. W.
6. FOLIACEOUS STALACTITE.							
Thick cones	soft	heavy	uneven, and as it were leafy	YELLOWISH	thin flakes, broken	Hartzforest	Stalactites Feuillette. W.

S P A R.

O R D E R IX.

S T A L A G M I T I C S P A R.

S T A L A G M I T E S.

Form'd into globular Figures, coated as an Onion.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. SUGAR-PLUM STALAGMITE.							
Small, round lumps	soft	heavy	scaly	PURE WHITE	thin coated	Italy	curiosity. Stalagmites Orobias. W.
2. GREY STALAGMITE.							
Round lumps	hard	heavy	bubbled	BROWNISH GREY	thick coated	Sweden	lime. Pisolithus. W.
3. OVAL STALAGMITE.							
Small, oval lumps	tender	heavy	smooth	YELLOWISH	crackly	Zweybreck, in Sweden	lime. Orobias Scheuk.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. FISH-SPAWN STALAGMITE.							
Great stony masses, of lit- tle oval lumps	soft	light	smooth	WHITISH	tender	Ketton, in Rutland	a building stone. Meconites Scheuk.
5. SAND STALAGMITE.							
Stony masses of small grains	hard	heavy	rudded	REDDISH	shattery	Cornwall	a flux. Ammites. B.
6. BLACK STALAGMITE.							
Small masses	very hard	heavy	scaly	DEEP BLACK	thin coated	Nerike, in Sweden	a flux. Cenchrates Niger Scheuk.

SPAR.

ORDER X.

INCRUSTING SPAR.

INCRUSTATIO.

Forming a stony coat upon mofs, or shells, or other substances.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BROWN INCRUSTING SPAR.							
A thin coat	very soft	light	rugged	PALE BROWN	brittle	Yorkshire, in waters	curiosity. Incrustatio Fusca.
2. GREY INCRUSTING SPAR.							
A thick coat	hard	heavy	wavy	GREYISH	firm	Sweden, on shells	curiosity. Incrustatio Albida.
3. RUDDY INCRUSTING SPAR.							
Rude coats	tender	very heavy	uneven	REDDISH	brittle	forest of Dean	curiosity. Incrustatio Rubescens.

THESE, so far as I have yet seen, are all the Species of Spar: but so many there are; and thus they may be arranged in a cabinet. They are more than is usually thought: but the eye shews them; and their existence cannot be disputed.

If the term Species be question'd, and it be said, that many here called such, are only Varieties; I cannot agree to that term as a subdistinction, tho' many, and great names support it. I should be sorry, any of those Authors entered into a dispute about it; for I should be obliged to tell them, that there is no real distinction of Species in Spar. Spar is but one body, and all its appearances are Varieties: however, the numbering them as Species, fixes their names; and ascertains the account, without the confusion of a useless subdistinction.

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Diaphanus. W.

Martialis. L.

à Deux Pointes. W.

Hexangulare. W.

trigonus. W.

Hexangulare. W.

trigonus. W.

Salinella-hedra. W.

W. munda-hedra. W.

Octa-hedra. W.

CRYSTALS.

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NATIVE FOSSILS.

CLASS IV.

CRYSTAL.

CRYSTALLUS.

A pure Fossil, bright, glassy, not fissile, nor breaking into regular forms.

IT has been said that Crystals break into Columns, as Spar breaks into Rhombs; but 'tis not so: the trial is easy; and will contradict the assertion: Spar is formed of connected Rhombs; Crystal is as a mass of melted glass.

Like Spar, or Selenite, it is one thing; what are called Species, are varieties; and these varieties arise from accidents, and are not in the nature of the body.

The natural place of Crystal is in the clefts of rocks: but only of such rocks as have a crystalline matter for their base. No man ever saw Crystal in the fissure of a limestone rock, or Spar in a crystalline one.

It sometimes lines these cavities with a pure wall of seeming glass; sometimes even fills the fissure with one vast mass; and when rendered foul by great quantities of earth, it forms whole rocks, whole mountains.

These

These splitting, water washes it pure again into the cracks; and thus is the eternal circle kept in being.

Pure Cryстал that has connected slowly, is colourless, pellucid, and of an angulated form; a Prism, with a Pyramid at each end; this is its proper shape: but as it has been disturbed in its formation, or fouled with mixtures, it assumes variously angulated Figures; or forms masses not angular; and loses of its transparency, and gains new colours.

Under this variety of appearances, it is to be considered in the arrangement of a cabinet; and thus its forms are to be laid down here: those who please may call them Species; those who chuse may enter them as varieties, or dispute about the vanity of terms: here they are laid down only as so many numbered appearances of the one thing Cryстал, and reckoned as no other. They will be best understood by distributing them into various Orders, according to their general marks of difference; and so much we allow: the rest is folly.

CRYSTALS.

ORDER I.

Of angulated Figures.

TRIBE I.

In form of a Prism of six fides, terminated by a Pyramid of fix fides, at each end.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE CRYSTAL*.							
Slender	very hard	heavy	bright, and polish'd	TRANSPARENT, AND COLOURLESS	pure	Bristol	Crystal de Roche à deux Pointes. W. glaſs.

* This differs in nothing from the form of pure Spar, but that the points are perfect and sharp here, never in the Spar.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. B O N E							
2. TOPAZ	* CRYSTAL.						Nitrum Lapidosum Flavum. L.
Short	hard	very heavy	glossy	YELLOW	very pure	the Brazils, and Bohemia	a gem.
3. HYACINTHINE	* CRYSTAL.						Nitrum Lapidosum Purpureosulvum. L.
Long, and slender	hard	heavy	polish'd	FLAME COLOUR'D	pure	Sweden	gem.
4. BERYLL CRYSTAL.							Nitrum Lapidosum Cyaneum. L.
Small	very hard	heavy	glossy	BLUE GREEN	watery	Germany	gem.

* These are called by some the occidental Gems, occidental Topaz, and the rest: but they are nothing but coloured Cryстал; the most perfect and finest of them keep the proper form of the Prism, with two Pyramids; but as they have concreted hastily, or been mixt with less pure matter in concretion, they lose of their Figure, keeping sometimes only one of the Pyramids, or in some scarce any angulated form; but still they are to be known by their brightness, and according to their colours.

Nitrum Lapidofum
Ceruleum.
L.

gem.

Bohemia

bright

FINE BLUE

polished

heavy

5. SAPPHIRE CRYSTAL.

Thick

hard

Nitrum Lapidofum
Viride.
L.

gem.

Switzerland

cloudy in
parts

PURE GREEN

bright,
and
glossy

heavy

6. EMERALD CRYSTAL.

Long

tender

Nitrum Lapidofum
Rubrum.
L.

gem.

Peru

perfectly
pure

FINE RED

lineated

heavy

Short and
thick

very hard

Nitrum Lapidofum
Violaceum.
L.

gem.

Bohemia

cloudy in
part

PURPLE

polished

very
heavy

8. AMETHYSTINE CRYSTAL.

Short and
thick

tender

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
9. BROWN CRYSTAL.							
Thick	very hard	heavy	freaky	DULL BROWN	clear	Norway	Nitrum Lapidosum Nigricans. L.
10. WHITE CRYSTAL.							
Large	tender	lighter	smooth	WHITISH	cloudy	Gloucester- shire	for seals. glaſs.
11. BLACK CRYSTAL.							
Small	very hard	heavy	gloſſy	PERFECTLY BLACK	opaque	Bristol	grottos, glaſs

Cryſtallus
Nigricans.
Bom.

CRYSTALS.

ORDER I.

TRIBE II.

In form of a Prism of six sides, with a Pyramid at one end; and fixed to the Rock at the other.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PURE SPRIG CRYSTAL.* Large	hard	heavy	glossy	COLOUR- LESS	perfectly pellucid	every where in rocks	Nitrum Lapidofum Oblongum. L. grottos.

* This is found coloured in all the dyes of the preceding. Those Specimens should be arranged under the pure, as in that Species; but they can have no new name; they are to be called Topaz Cryfal, as the former. There must be but one name for them, and those; for they are but one thing in nature and in construction, tho' the forms differ.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. BROAD SPRIG CRYSTAL. Large	hard	very heavy	polished	WATERY	cloudy	Bristol	* Nitrum Quartzosum Lateribus duobus latioribus. L. glaſs.
3. NARROW SPRIG CRYSTAL. Small, and long	hard	very heavy	gloſſy	WHITISH	foul	Forest of Dean	glaſs.
4. LONG SPRIG CRYSTAL. A ſmall, long column	very hard	heavy	bright	COLOUR-LESS	perfectly pellucid	Swiſſerland	Cryſtallus Planis Intermediis Majoribus Steno. glaſs.
5. SHORT SPRIG CRYSTAL. A thick, ſhort column	hard	heavy	rugged	WHITISH	cloudy	Germany	Nitrum Lapidolum Subacule. L. glaſs.

* Linnæus has been free in the uſe of the name, Nitre, for theſe Cryſtals; for by his plan they are kinds of Nitre. I love and honour him, but can't adopt this Salt Syſtem. I hate to contradict a Genius of ſo vaſt merit; but we muſt by that freedom, come at real knowledge. It is not Nitre Cryſtal moſt emulates in its form: 'tis the vitriolated Tartar that Cryſtal reſembles; an artificial, not a natural Salt.

CRYSTALLS.

TRIBE III.

In form of Pyramids, without a Column.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CLEAR DOUBLE CRYSTAL. Two short pyramids, base to base	hard	heavy	glossy	COLOUR- LESS	pellucid	Sweden	Nitrum Lapidofum Acaule. L. glaſs.
2. BROWN DOUBLE CRYSTAL. Two thick pyramids	hard	heavy	lineated	PALE BROWN	pellucid	Grenades	glaſs.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
3. LOW CRYSTAL. *							
A pyramid fixt to rock	very hard	heavy	bright, and glossy	COLOUR- LESS	pellucid	Bristol	grottos.

* Of this form also there are occidental Gems; they should be ranged under this, in a cabinet, as varieties of this variety, but they can have no other names than the first, because they are no other thing.
All these kinds of Crystal are best understood when we find them single, but they are most frequent in clusters; the single ought to be placed first in each kind, and the clustered to follow.

C C R Y S T A L S.

T R I B E IV.

Angulated Crystals, fouled.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. COATED CRYSTAL.							
A covered column	hard	heavy	very rugged	RED OR GREEN.	colourless when the coat is off	Cornwall	Nitrum Lapidosum Opacum. L. grottos.
2. WATER CRYSTAL.							
A column with a drop in it	hard	light	glossy	COLOUR-LESS	streaky	Germany	curiosity.
3. HOLLOW CRYSTAL.							
A column empty and hollow	hard	heavy	polished	WHITISH	watery	Switzerland	Nitrum Lapidosum Inane. L. curiosity.
4. TALCY CRYSTAL.							
A column	hard	heavy	glossy	COLOUR-LESS	with spangles of Talc within	Germany	curiosity.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. ASBESTINE CRYSTAL.							
A thick column	hard	heavy	lineated	PELLUCID	fibres of Asbestos within	Sweden	curiosity.
6. MARCASITE CRYSTAL.							
A column	hard	heavy	streaky	CLEAR	spangles of marcasite within	Germany	curiosity.
7. ANTIMONIATE CRYSTAL.*							
A coarse column	hard	heavy	rugged	WHITISH	with antimony ore in it	Sweden	curiosity.

* There may be more of these, and they should have their places after them. These are all I have seen: and 'twill be well if those who fancy others, will attend to Cronstedt's caution, and see they do not take Asbestos for grafs, and earth for moss.

C R Y S T A L S.

O R D E R I. T R I B E V. S A N D S. A R E N Æ.

Broken; irregularly angulated, and in form of powder.

I. P U R E S A N D S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
1. P U R E C R Y S T A L L I N E S A N D.							
Large dust	hard	heavy	glossy	C O L O U R - L E S S	angulated	Perfia	Arena Mobilis α. L.
2. R O U N D C R Y S T A L L I N E S A N D.							
Round granules	hard	heavy	rough	C O L O U R - L E S S	rounded	the Me- diterranean shores	Arena Mobilis β. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. VOLATILE SAND.							Arena Mobilis γ . L.
Fine dust	soft	light	dufty	WHITISH	angulated	Arabia	
4. ORANGE SAND.							Arena Colorata α . Lin.
Large grains	hard	heavy	rugged	ORANGE-COLOUR'D	coarse	Surinam	
5. WHITISH SAND.							Arena Colorata β . L.
Rough particles	hard	heavy	rugged	WHITE	opaque	Hertfordshire	
6. PALE YELLOW SAND.							Arena Colorata γ . L.
Irregular grains	hard	heavy	rugged	PALE YELLOW	foul	every where	

7. RED SAND.	Large grains	hard	heavy	smooth	DULL RED	clear	Shores of Red Sea	Arenaria Colorata L.
8. VIOLET SAND.	Large grains	hard	heavy	polished	PURPLE	bright	Shores of the Baltic	Arenaria Colorata L.
9. PALE SAND.	Great granules	hard	heavy	smooth	PALE YELLOWISH BROWN	rounded grains	Shores of rivers	Arenaria lacustris L.
10. HILL SAND.	Irregular grains	hard	heavy	uneven	BROWNISH GREY	some rounded grains	high grounds and woods	Arenaria Campestris L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
II. COATED SAND.							
Large grains	soft	heavy	coated with earthy shells	WHITE	rounded grains	Sweden	Arena Margaria. L.
12. HEATH SAND.							
Very small grains	soft	light	dufty	REDDISH GREY	rudely angulated	Heathsevery where	Arena Glarea. L.
13. OCHREOUS SAND.							
Small grains	soft	light	rough	YELLOW	angulated	near ferrugi- nous springs	Arena Ochracea. L.
14. FLINTY SAND.							
Great particles	harsh	heavy	polished	HORN COLOUR'D	angulated	England	Arena Silicea. L.

2. MIX'D SAND S.

15. RUSTIC SAND.

Rude parti-
cles

harsh

light

rugged

BROWN,
AND GREY

mix'd of
broken
stone, and
sand

Suffex,
Sweden

Arena
Rustica.
L.

16. RUGGED SAND.

Unequal
particles

harsh

light

rough

BROWN,
AND
WHITE

of stone,
sand, and
talc

Sweden

Arena
Sabulum.
L.

17. CASSERITE SAND.

Fine parti-
cles

soft

light

smooth

MILKY
WHITE

spangles
of glim-
mer

Casserite
Island

Arena
Casserita.
L.

18. YELLOW GLIMMER SAND.

Small par-
ticles

soft

light

glossy

GOLD
YELLOW

of yellow
mica, and
sand

Sweden

Arena Micacea
Aurea.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. WHITE GLIMMER SAND.							
Small particles	soft	light	glossy	SILVERY WHITE	of white mica, and sand	Sweden, Germany	Arena Micacea Argentea. L.
20. GOLD SAND.							
Uneven particles	harsh	heavy	shining	YELLOWISH	grains of pure gold	Africa, and East Indies	Arena Aurea. L. for gold.
21. IRON SAND.							
Sharp particles	hard	heavy	glittering	BLACK	angulated and flattened particles	Italy, Sweden	Arena Ferreæ. L. for writing.
22. GRANITE SAND.							
Rude particles	harsh	heavy	shining	MIXT OF WHITE, RED, GREEN, &c.	of fragments of granites	Minorca, &c.	'Saburra [Granatica, H.

Saburra
Porphyryna.
H.

Areha
Ægyptiaca.
N.

23. PORPHYRY SAND †.		Y S A N D S.		Ægypt	
Unequal parts	hard	smooth	MIXT OF PURPLE, WHITE, &c.	composed of frag- ments of porphyry	
3. S H E L L		BROWN, AND WHITE		mix'd of crystal, talc, and broken shells	
24. ÆGYPTIAN HOUR-GLASS SAND ‡.		light		dull	
Unlike par- ticles	soft				Ægypt

† These are formed of fragments of Granite, Porphyry, and other Stones, beaten to powder, one against another. They are not genuine Sands, and there may be as many kinds enumerated as there are Stones; but these in their genuine state, will have their place hereafter.

‡ This, and the three following, are now first known to me; the gift of my great patron. They are objects for the microscope, and of the very finest kind; they are full of minute, but perfect shells; many of them Species, not otherwise known.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
25. CHIOZAN SAND.							
Most unlike particles	harsh	light	shining	BLACK, WHITE, AND REDDISH	of crystal, iron, sand, jet, marca- site, and en- tire small shells	Italy	Arena Chiozana.
26. RIMINIAN SAND.							
Very large, unlike par- ticles	harsh	light	glittering	BLACK, AND WHITE	of crystal, iron, sand, jet, corals, and entire shells	Rimini	Arena Riminiana. N.
27. BONONIAN SAND.							
Foul par- ticles	soft	light	dull	YELLOWISH	of crystal, talc, clay, and small ammonitæ	Italy	Arena Ammonifera. N.

CRYSTALS.

ORDER II.

In masses not angulated.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PEBBLE CRYSTAL.							
A round lump	hard	heavy	wavy	COLOUR- LESS	pellucid	Brasils, &c.	Quartzum Purum Cronstedt. spectacles.
2. WHITE PEBBLE CRYSTAL.							
Round stones	hard	heavy	uneven	WHITISH	watery	Sweden	Quartzum Pingue Cronstedt. glaſs.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. BLUE PEBBLE CRYSTAL.							
Small lumps	very hard	heavy	smooth	PALE BLUE	clear	Island of Uto	Quartzum Caruleum Cronstedt. a false gem.
4. AMETHYSTINE PEBBLE CRYSTAL.							
Large lumps	hard	heavy	glossy	VIOLET PURPLE	clear	Island of Uto	Quartzum Amethystinum Cronstedt. a false gem.
5. SANDY PEBBLE CRYSTAL.							
Great lumps	very hard	very heavy	granulated	MILKY	cloudy	Sweden	Quartzum Granulatum Cronstedt. glafs.
6. GREENISH PEBBLE CRYSTAL.							
Small lumps	hard	heavy	rugged	PALE GREEN	clear	Sweden	Quartzum Granulatum Virefcens Cronstedt. glafs.

* Quartzum
Spatosum
Cronstedt.

7. SHATTERY PEBBLE CRYSTAL.

Vast masses | hard | very heavy

8. YELLOW SHATTERY CRYSTAL.

Vast masses | very hard | heavy

9. BLOCK CRYSTAL.

Vast stones | very hard | heavy

10. CURTAIN CRYSTAL.

Vast sheets | hard | heavy

breaks in-
to broad
Plates

WHITE

Sweden

glafs.

PALE

flaky

Gold mines
of Hungary

glafs.

YELLOWISH

BROWN

Germany,
in cracks of
rocks

clear

WHITISH

glafs.

CLEAR

watery

Persia

glafs.

AND CO-

LOURLESS

* The names of authors run out to an immoderate length; those I give from them mark the difference of kind, and are a sort of rendering them from Specific, into Trivial; this may serve as an instance: the words Quartzum Spatosum are not in Cronstedt, but whoever turns to his chapter of Quartzum, and finds the name Quartzum Textura Spatofo, will know 'tis that quoted here, and spare the Textura, I hope, with pleasure.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
11. BLACK PEBBLE CRYSTAL.							
Vast lumps	very hard	very heavy	botryoid	BLACK	crackly	Sweden	Quartzum Ferream Cronstedt. an iron ore.
12. RUDDY PEBBLE CRYSTAL.							
Great masses	hard	very heavy	irregular	DULL RED	crackly	Smoland	Quartzum Cupro Mixtum Cronstedt. a copper ore.
13. JACOBINE PEBBLE CRYSTAL.							
Round lumps	very hard	heavy	wav'd	VEIN'D BLACK AND WHITE	dull	Sweden	Quartzum Aqueolactum. W. Lutum Strab.
14. WORM-EATEN PEBBLE CRYSTAL.							
In sieve-like masses	hard	heavy	rugged	BROWNISH	eaten in holes as it were	Germany	Quartzum Granatum. W.
15. RIDG'D PEBBLE CRYSTAL.							
In rounded masses	hard	very heavy	ridg'd	BROWNISH RED	raised in edges	Germany	

NATIVE FOSSILS.

CLASS V.

GEMS.

Hard, bright, sparkling; in small angulated masses;
composed of fine Plates.

THE Gems are naturally angular, as are the Crystals: but like them, from various accidents in their formation, they are found sometimes in rude or shapeless masses; and when angular, they have still all that variation of Figure which we see take place in Crystal and Spar; from the different disturbances of their crystalization. In all these cases the various number of angles may be occasioned, as we see in Salts, from the accidents of their concretion. In these, as well as in those, we have the same kind in different Figures; and as we can crystalize them under the eye, we can determine the causes of those alterations. The round, or pebble Gems, seem not to have been original in that form, but worn to it by rolling about in a fluid.

The hardness and the lustre of the Gems, must distinguish them from all other Stones; for if we considered their form, as their essential character, many Crystals would assume the name: and Cronstedt

has well determined, that a certain Spar he had seen in Figure of the most regular Diamond, must then be call'd, a Diamond.

No peculiar construction, no form of constituent parts is visible in the Gems: they appear as masses of uniform nature; and they break irregularly and indeterminately; yet there is in all a really plated structure. The Lapidaries find this in some, and can split them; the burning glass discovers it in the rest; and when turned to it in a right direction, tears them to pieces: they split into the thinnest Plates that can be conceived, and seem to have been composed in the manner of the Talcs, only more compact. 'Tis pity this character is not more obvious: for it affords a real distinctive mark between the Gems, and all other Stones: Crystals, which seem to come nearest to them, have it not.

Their colours are less essential, for they can in most be driven away by fire; and nature sometimes gives the Gem without them; they are evidently owing to the metals; for we can by means of metals, give the same to glass; our artificial Gem.

The Salt System of Linnæus appears here almost ludicrous. To a truly philosophic eye, the difference of estimation and price are nothing; but the common Reader will hardly keep his countenance when he sees the Diamond reduced to a Species of Alum; and the Emerald of Borax.

DIAMONDS.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
1. ORIENTAL DIAMOND.							
Octahædral	hardest	heaviest	brightest	LIVELIEST	most sparkling of all gems	East Indies	Adamas Gemma. W.
2. BASALTINE DIAMOND. BRAZIL DIAMOND.							
Dodecahædral	very hard	heavy	bright	LIVELY	sparkling	Brafsils	Le Diamant de Brasfl de Lifse.

The form of the Brazil Diamond differs from the Oriental, as well as do its qualities: there are Shirly, or Basaltine, resemblances of all the Oriental Gems; and this is such of the Diamond; and no other. De Laet was acquainted with it, and with its qualities. Agricola knew its Dodecahædral form. Wallerius accurately describes its faces by their cubic shape. The Brazil Diamond has the same electric, and the same philosophic properties, with the Oriental: After it has been held

held in the sun, it has a silvery brightness in the dark; and the same quality, in some degree, when rubb'd: and it takes the foil, as the Oriental Diamond. But they all want the perfect hardness of the Oriental Diamond; and they have somewhat less specific gravity; and they can be melted by the extream force of fire, which the Oriental Diamond cannot; it can only be torn into flat Flakes, and that way shews it has a structure such as the Zeolite, tho' like that it be obscure.

We are not to expect all Diamonds in their perfect crystalized form; we see them rounded in the manner of the pebble Crystals, and like all other crystalized Stones, they vary in the number of the angles, even in the same Species.

Like all the other crystalline stones, this is also liable to be tinged to all colours; but these tinges it receives in so small a quantity, and in a degree so delicate, that it is a doubt whether a coloured Diamond be not more beautiful even than a perfect clear one.

We talk of our vast Diamonds, the Tuscan, the Sancy, and Pitt's; but what are these to that of the Mogul, which before cutting weighed very near eight hundred carats?

I. E M E R A L D S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. ORIENTAL EMERALD.							Smaragdus Orientalis. W.
A column with a Pyramid * mid *	very hard	heavy	bright, and polished	PURE GREEN	keeps its colour in the fire	Ægypt	ornament.

2. OCCIDENTAL EMERALD.				S A P P H I R E S.				Smaragdus Occidentalis. W.	
A Prism without a Pyramid	tender	heavy	glossy	S A P P H I R E S.	Pegou, Conanor, Ceylon	ornament.	Smaragdus Brasiliensis De Laet.	Smaragdus Occidentalis. W.	
3. BRASILEMERALD.									
A Prism with two Pyramids	soft	heavy	bright, and glossy	S A P P H I R E S.	Pegou, Conanor, Ceylon	ornament.	Smaragdus Brasiliensis De Laet.	Smaragdus Occidentalis. W.	
1. ORIENTAL SAPPHIRE†.									
A Rhomb of unequal fides	very hard	heavy	glossy	S A P P H I R E S.	Pegou, Conanor, Ceylon	ornament.	Smaragdus Brasiliensis De Laet.	Smaragdus Occidentalis. W.	

* This is the perfect form; but we have said, how often it is altered, or defective, or rubb'd away, 'tis so in all; but the true form should always be known.

† The Sapphire has been supposed the same Stone with the Diamond, but 'tis not so: we have blue Diamonds, which are not Sapphires; and colourless Sapphires, which yet are not Diamonds; but they are very near it: one passed thro' many Jewellers hands as such some years ago.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. OCCIDENTAL SAPPHIRE.							
A furrow'd Prism with an obtuse Pyramid	tender	heavy	bright, but uneven	PALE BLUE	keeps its colour	Peru	Sapphirus Femina. W. ornament.
3. GRASS SAPPHIRE.							
An octangu- lar Prism with a Pyra- mid	soft	heavy	wavy	BLUE, WITH A TINGE OF GRASS GREEN	loses its colour in the fire	Bohemia	Sapphirus Subviridis. W. ornament.
I. ORIENTAL RUBY.							
Octohædral of trigonal Planes	extreamly hard	heavy	bright, and polished	PURE, PER- FECT RED	keeps its colour in the fire	Pegou	Rubinus Orientalis. W. ornament.

2. BRASILL RUBY.

A Prism of
unequal
sides, with a
triangular
Pyramid

hard

heavy

streaky

PALE RED

keeps its
colour in
fire

the Brazils

ornament.

Rubinus
Incarnatus.
W.

3. SPINELL RUBY.

A Prism
with an irre-
gular Pyra-
mid

tender

heavy

scaly, but
bright

ROSE-
COLOUR

loses its
colour in
the fire

Peru

ornament.

Rubinus
Subalbus.
W.

4. TAWNY RUBY.

A short
Prism with
a long Pyra-
mid

tender

heavy

uneven,
and
streaky

BROWNISH
RED

loses its
colour in
the fire

Silesia

ornament.

Rubinus
Rubacellus.
W.

T O P A Z		E S.		P L A C E.		U S E S.	
FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. ORIENTAL TOPAZ.							
Two quadrangular Pyramids, base to base	extreamly hard	heavy	bright, glossy	JONQUILLE YELLOW	keeps its colour in the fire	East Indies	ornament.
2. BRASILE TOPAZ.							
A Prism of four sides, with two Pyramids	hard	heavy	polish'd	GOLD YELLOW	loses its colour in the fire	Brazils	ornament.
3. ORANGE TOPAZ.							
A Prism with one Pyramid	tender	heavy	glossy	RUDDY YELLOW	loses its colour in the fire	Germany	ornament.

Topazius.
W.Topazius
Aureus
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. SAXON TOPAZ.							
An octahæ- dral Prism, with two Pyramids	hard	heavy	rugged	PALE BROWN, PALE YEL- LOW, OR CO- LOURLESS	bright	Schneken- stein, in Saxony	Topazius Saxonicus Cronstedt. ornament.
5. CHRYSO-LITHES.							
1. ORIENTAL CHRYSOLITE.							
A Prism of six fides, with two Pyramids of four fides	very hard	heavy	polished	YELLOWISH GREEN	keeps its colour in the fire	Cananor	Chrysolithus Praefoides. W. ornament.
2. OCCIDENTAL CHRYSOLITE.							
A Prism of five fides, with no Pyramid	tender	heavy	bright	PALE GREEN, WITH A YELLOW TINGE	loses its colour in the fire	Brazils	Chrysolithus Crysolpralus. W. ornament.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
3. GOLD CRY SOLITE.							
A Prism with one Pyramid	hard	heavy	streaky	GOOD GREEN, WITH A CAST OF GOLD YELLOW	keeps its yellow in the fire	Peru	ornament. Chrysolithus Praefus. W.
H Y A C I N T H S.							
1. ORIENTAL HYACINTH.							
A long Prism of four fides, with two Pyramids	very hard	heavy	striated	FLAME- COLOUR	keeps its colour in the fire	East Indies	ornament. Lyncurius Veterum. H.
2. BOHEMIAN HYACINTH.							
A short Prism of four fides, with one Pyramid	hard	heavy	smooth, and glossy	YELLOWISH RED, WITH A TINGE OF GREEN	keeps its colour in the fire	Bohemia, Poland	ornament. Hyacinth Chrysope de Lisse.

3. J A R G O N H Y A C I N T H. *

Jargon
d'Hyacinthe
De Lisle.

A long
Prism, with
one Pyramid

very hard

heavy

ornament.

France

PALE
YELLOWISH
RED

keeps its
colour in
the fire

6. G A R N E T S.

1. O R I E N T A L G A R N E T.

A short
hexhædral
Prism with
two Pyra-
mids

hard

very
heavy

Pegou

ornament.

BLOOD RED,
FIRE-CO-
LOUR'D TO
THE LIGHT

keeps its
colour in
the fire

ridged

2. S O R A N E G A R N E T.

A short
Prism, with
one Pyramid

very hard

very
heavy

glossy

East Indies

ornament.

keeps its
colour in
the fire

DEEP
ORANGE
SCARLET

Grenate
de Surian
De Lisle.

* This Stone is sometimes colourless, and has been call'd, a Soft Diamond; a term that needs no comment.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. JACINTH GARNET. A long Prism, with two Pyra- mids	very hard	heavy	bright	CRIMSON, WITH A YELLOW TINGE	keeps its colour in the fire	Coromandel	Giacinto Guarnaccino De Lisle. ornament.
4. VIOLET GARNET. A short Prism, with one Pyramid	hard	heavy	polish'd	DEEP RED, WITH A PURPLE TINGE	keeps colour in the fire	Pegou	Rubino della Rocca De Lisle. ornament.
5. DEEP GARNET. Rounded and Polygonal	tender	very heavy	glossy	BLOOD RED	keeps its colour in the fire	Bohemia, in rocks	Grenat de Boheme De Lisle. ornament.
6. SPANISH GARNET. Globular, with many rhomboidal faces	tender	heavy	streaky	LIGHT RED	loses its colour in the fire	Spain, in flats	Grenat d'Espagne De Lisle. ornament.

C L A S S VI.

S H I R I.

B A S A L T E S.

An impure crystalized Fossil, hard and heavy; in form of polygonal Prisms, with trigonal heads.

TIS necessary this should follow the Garnets; for 'tis ally'd to them most nearly in form, and qualities; the number of faces in the Prism is various, and the Head is often wanting, but the Body is always to be known: and tho' but lately understood, is worthy great attention.

Its constituent parts are variously put together, but in themselves they are always the same: thus we see fibrous, flaky, and glassy shirls: the structure of the Talcs, the Crystals, and the Spars, are seen in their fragments; but still the constituent substance is the same. No wonder those who looked but little farther than the surface, were perplexed with this; but to a deeper search all becomes plain.

Linnæus refer'd the Shirls to Alum, for their form; De Boet considered them as Crystals: the late excellent

cellent Cronstedt seems to have understood them well : he first discovered their close resemblance to the Garnets ; and (discovering also the perfect uncertainty and vague determination of the sides and faces in the Garnets) connected both together for their matter ; and neglected (with great reason in his work) their form.

When pure, the Shirls strike fire with steel ; but some are so debased with earthy mixtures, that they do it poorly. None of them ferment at all with acids ; they all become electrical when heated : their number of faces varies in the same mass, one Prism being made to suit two others : as to size, we see them from that of Barley-Corn up to the Giant's causeway.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
1. STOLPEN SHIRL.							
A simple Polygonal column, with a trihædral head	very hard	very heavy	smooth	RAVEN GREY	ten foot long	Misnia	curiosity.
2. IRISH SHIRL.							
GIANT'S CAUSEWAY.							
Jointed columns	hard	heavy	smooth	PERFECTLY BLACK	immense, of various faces, but alike in all the joints of each column.	Antrim	curiosity.
3. SPANISH SHIRL.							
CROSS STONE.							
A black and white cross	hard	heavy	glossy	BLACK, AND PURE WHITE	small, with the figure of a cross	Andalusia	amulet.

Basaltes
de Stolpen.
W.

Basaltes
Hibernicus
Pl. Tran.

Lapis
Crucis.
W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. FLINTY SHIRL.							
An oblong black Prism, with two Pyramids	very hard	heavy	polished	BLACK	glassy, when broke	Germany	Borax Lapidus Triquetrus. L.
5. RUDDY SHIRL.							
An oblong, ruddy Prism, with one Pyramid	hard	very heavy	smooth	RUDDY BROWN	granulated	Nerike, in Sweden	Basaltes Rufus Cronstedt.
6. GREEN SHIRL.							
A short, green Prism, with one Pyramid	tender	heavy	glossy	PALE GREEN	cloudy within	Sweden	Basaltes Virens Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. MULTANGULAR SHIRL.							
A Prism of many sides, with two Pyramids	hard	heavy	polished	DEEP GREEN	foul within	Germany	Schorl Verde Davila.
8. WHITISH SHIRL.							
White, long, angulated needles	tender	light	glossy	WHITISH, WITH A TINGE OF BROWN, OR BLACK	clustery	Bristol	Schorl d'Aiguille Davile.
9. VESUVIAN SHIRL.							
A hexædral flattened Prism, with two Pyramids	hard	heavy	even	YELLOWISH, OR BLACKISH	clustery	Mount Vesuvius	Basalte de Vesuvius De Lisle.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. DEBAS'D SHIRL.							
Vast rude masses	hard	very heavy	irregular	BROWN, WITH GREY, RUDDY, OR BLACK SPOTS	stony	Sweden	Balsates Saxcus Cronstedt.

CRYSTALLS.

ORDER VIII.

Z E O L I T E S.

Pure Fossils in columnar forms, hard, heavy, bright, and flaky.

These resemble the Shirl in all things; but that, when viewed with good glasses, their texture is flaky. They are harder than Spars, but less hard than pure Crystal; they do not effervesce with acids, but they are soluble in that of Nitre; and the solution becomes a hard jelly.

They melt freely in the fire, and yield a light like the flame of electricity just in the moment of their fusion.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. JONQUILLE ZEOLITE.							
Convergent Pyramids	hard	heavy	perfectly polished	JONQUILLE YELLOW	cluster'd, in small flakes	Sweden	Zeolithus Crystallizatus Cronstedt.
2. PURE ZEOLITE.							
A truncated Prism	hard	heavy	glossy	COLOUR- LESS	single, with fine flakes	Sweden	Zeolithus Distinctus Cronstedt.
3. HYACINTHE ZEOLITE.							
Small masses	tender	very heavy	glossy	FLAME- COLOUR'D	shattery	Sweden	Zeolithus Spatosus Cronstedt.
4. BLUE ZEOLITE.							
Rude masses	hard	very heavy	uneven	BLUE, WITH YELLOW AND WHITE SPOTS	breaks like flint	Persia	Zeolithus Cærulens Cronstedt.
5. WHITE ZEOLITE.							
Large masses	very hard	heavy	rugged	YELLOWISH WHITE	flinty	Denmark	Zeolithus Durus Albus Cronstedt.

NATIVE FOSSILS.

CLASS VII.

ASBESTINE FOSSILS.

ASBESTIÆ.

Pure Fossils, composed of strait, parallel threads, flexible, but not elastic.

THE Asbestos bear the fire ; and webs wrought of them may be cleaned by burning : but this is never done without a degree of injury ; for on the most careful trials, I have always found Native Asbeste of the same kind more flexible than what has been burnt : there is a leathery toughness in most of the pure sorts, when kept as they were taken out of the earth ; but it is lost by burning.

'Tis said, the Asbesti are formed of Talc, resolving itself into Clay : it must then have been striated in the plated state : but 'tis not so. Few people have glasses of more power than mine, and I have examined the purest Talc, but never seen this. If these authors would infer it from some debased talcy substances, which are striated, they want that precision, without which little is to be determined in this study. Besides, this change would infer, that the alteration of form
ren-

renders the same body different in the fire; the last and greatest of all tests of Fossils.

Talc is unalterable in the fire; Asbeste is hardened in it; and Clay runs to Glass: therefore, according to this plan, one body, Talc, can afford three different conditions in the fire; as it happens without mixture, for that is not supposed, only that it has changed its form. I reverence Linnæus, yet do not receive his assertion, *Mica concretio Argillæ*, as absolute and certain: nor will himself, when he has but given it this consideration: nor yet the general character, *Amianthus lapis ex Argilla*; till we have found *Mica Amianthus* and *Argilla*, suffer the fire alike. Nor will the opinion of Cronstedt overrule the doubt, for 'tis but an opinion; and I should have expected, and have wished, to have found it rather in any other author.

The Asbestos are the softest, and the lightest of all minerals; they have no determinate manner of breaking; they always lie in the beds with horizontal fibres; never perpendicular, and seldom much inclin'd; they are so tough you twist them like hemp; so light they swim on water: too soft for striking fire; and too fixed for all the power of acids. Some resemble animal, as others vegetable substances; and hemp and leather equally are imitated by them: some masses look like Fossil wood; and some like efflorescences of Salts, but they soon disclose their nature, on handling; separating easily into threads, and having nothing of a saline quality.

A S B E S T I N E

ASBESTINE FOS SILS.

ORDER I.

ASBESTE.

ASBESTUS.

Composed of strait, even, parallel, long threads.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. PURE ASBESTE*.							
Long, entire threads	tender	very light	glossy	GREY	most flexible	Siberia, Cyprus	Amiantus Albestus L. wicks of lamps

* This is spun into purfes, and made into paper ; but there is more in the name than the use.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. GLASSY ASBESTE.							
Bright, short threads	hard	heavy	polished	OLIVE-COLOUR'D	brittle	Sweden, Anglesea	Amiantus Fragilis. L. curiosity.
3. WOODY ASBESTE.							
Masses like fossil wood	hard	heavy	streaky	PALE BROWN	scarce separable into threads	Italy	Amiantus Immaturus. L. curiosity.
4. EARTHY ASBESTE.							
Flat, coarse plates	tender	heavy	clay-like, but striated	PALE GREY	breaks in parting	Germany	Amiantus Terrestris. L. curiosity.
5. RADIATED ASBESTE.							
In starry clusters	hard	heavy	glossy	OLIVE-COLOUR'D	moss-like	Sweden	Amiantus Radians. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
6. GREEN ASBESTE.							
Flat masses	tender	heavy	uneven	DIRTY GREEN	not to be separated into threads	Germany	Asbeste non Mur Verdâtre. W.
7. BLACK ASBESTE.							
Small masses	hard	heavy	glossy	DEEP BLACK	scarce separable	Crete	Asbeste non Mur Noirâtre. W.
8. CRYSTALLINE ASBESTE.							
Thin plates	hard	heavy	polish'd	COLOUR- LESS	not separable	Germany	Asbeste non Mur Transparente. W.
9. BRUSH ASBESTE.							
Small tufts	tender	heavy	rugged	GREYISH	firm	Sweden	Asbeste en Bouquets. W.

ASBESTINE FOSSILS.

ORDER. II.

AMIANTH.

AMIANTUS.

Composed of slender, cluster'd fibres, intricately mixed.

THESE partake so much of the Asbestine nature, that they always lie lengthwise, not perpendicularly in their beds: and they split lengthwise only, tho' it be less regularly than the Asbestos. The Amianths will not spin into cloths, but paper may be made of some of them, and 'tis curious to see the writing burnt out, and the paper clean for fresh use: but the use is little.

Reiger has taken great pains to prove it a vegetable substance, not mineral; but his numerous reasons might have been all obviated, if he had thought of putting a bit of it into the fire.

It is singular, that a substance very much resembling the Amianths, may be made by art, with Arsenic, and the Vitriolic Acid.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PLUME AMIANTH. PLUME ALUM.							
Oblong masses	soft	very light	woolly	PALE GREY	swims in water	Denmark	Amiantus Plumofus. irritation in palfies
2. CHAFF AMIANTH.							
Rough lumps	brittle	light	prickly	RUDDY GREY	sinks in water	Sweden	Lapis Acerofus Rafilis. W.
3. HARD AMIANTH.							
Small clusters	hard	heavy	covered with points	GREY	sinks in water	Germany	Lapis Acerofus Rigidus. W.

4. PERPLEX'D AMIANTH.

Small maffes

tender

heavy

unevenly
streak'd

WHITISH

fwims in
water

Sweden

Amiantus
Implexus
L.

5. RUDDY AMIANTH.

Rude lumps

hard

heavy

irregular

REDDISH

sinks in
water

Germany

Byffus
Martialis
Cronstedt,

6. GREEN AMIANTH.

Large,
flatted maffes

tender

heavy

wav'd

DULL
GREEN

sinks in
water

Sweden

Byffus
Virefcens
Cronstedt.

a copper ore.

ASBESTINE FOSSILS.

ORDER III.

CARYSTINES.

CARYSTIA.

Composed of flaky plates, formed of inseparable, tough fibres.

THESE are in their original, fibrous, as well as the preceding kinds; but the fibres are formed into small flat flakes; and these flakes again into larger masses of the same form and kind. These are tough, flexible, and light; and to a stranger would appear rather of animal, or vegetable, than of Fossil origin. But the place where they are found, their structure when examined with glasses, and their resisting the force of fire, shew clearly what they are.

1. LEATHER

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. LEATHER CARYSTINE.							
Flat membranes in cracks of rocks	soft	very light	like flannel	YELLOWISH GREY	swims on water	Sweden	Amiantus Aluta. L.
2. FLESHY CARYSTINE.							
Thick, flat cakes	soft	light	undulated	WHITISH	swims on water, very flexible	Germany	Amiantus Caro Montana. L.
3. CORK CARYSTINE.							
Broad masses	soft	light	uneven	RUDDY BROWN	soaks in the water, and then finks	Saxony	Amiantus Suber L.
4. YELLOW CARYSTINE.							
Great flakes	tender	heavy	wav'd	OCHEOUS YELLOW	finks in water	Sweden	Caro Montana Flavicans Cronstedt.

NATIVE FOSSILS.

CLASS VIII.

EARTHS.

TERRÆ.

Fossils composed of imperceptible particles, united into firm, but not hard masses.

THE Earths are a numerous tribe ; but they have been supposed more numerous than they are : Sands have been counted among them, which are not of their nature, nor answer to their common character.

They are very important in their uses to mankind ; and therefore worthy a place in all cabinets ; tho' they add little to their beauty.

There are five principal kinds of Earths :

- | | |
|------------|------------|
| 1. CLAYS, | 4. MOULDS, |
| 2. CHALKS, | 5. BOLES, |
| 3. MARLES, | 6. OCHRES. |

These serve for purposes perfectly various ; and are in their nature evidently distinct ; and easily distinguishable by their characters.

Two are primitive Fossils, Chalk, and Clay ; Mould is perfectly adventitious, and variously mixed ; Marles have animal remains ; and Boles and Ochres have always a metallic mixture : the Alkaline Earths (here called Chalks, for the sake of a shorter name) have been supposed of animal origin ; and they are now received as such ; but the matter does not appear thus to me. I must be indulged in the use of my own experience ; but the reasons of my doubts will be seen, and may be judged by all.

Earths are tender, tho' compact ; they may be rubb'd to pieces in the hands, tho' some more difficultly than others : they disunite in water, but do not dissolve in it.

EARTHS.

E A R T H S.

O R D E R I.

C L A Y S.

A R G I L L Æ.

Tough, ductile, heavy, smooth masses.

THE distinctions of Fossils are all relative: but they become absolute when viewed in comparison with the other bodies of the same kind: so these four words comprehend a character of Clay, by which it will be distinguished at sight from all other kinds of Earths.

This Distinction of an Earth from other Earths is all that should be attempted in the character of an Order.

The difference of Earths from other Fossils is given in the character of the Class.

Linnæus describes Clay as a precipitation of a tough Sea-water. 'Tis well we need not enquire minutely into this; for it would not bear such enquiry.

Wallerius tells us, Clays are form'd of cubic particles. This we ought to enquire into; and I am sorry to say, we do not find it so. I wish it were; 'twould be a great natural distinction.

If we would lay down the Earths as Cronstedt, we must take in the Spars, the Crystals, Tales, and even the Gems. Yet this was right in him, whose work was destin'd to the use of miners. Let me not seem to blame authors, where I decline adopting their opinions. These deserve respect, nay, reverence, all of them; but men are not infallible: and if one work were perfect, we need not labour after more.

All Clays look dull when broken; all soften and become unctuous in water; and all harden in the fire.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. WHITE CLAY.							
Vast strata, deep	very tough	very heavy	very ductile	PURE WHITE	unctuous	Isle of Wight	tobacco pipes. Argilla Apyra. L.
2. GREY CLAY.							
Vast strata	tough	heavy	ductile	GREYISH	fatty	Germany	tobacco pipes. Argilla Leucargilla. L.
3. PURPLE CLAY.							
Thin strata	very tough	heavy	very ductile	PALE VIOLET- COLOUR	unctuous	France	furnaces. Argilla Violacea. L.
4. BLACK CLAY.							
Deep, thick strata	tough	very heavy	less ductile	BLACK	grows white in the fire	Montmartre	tobacco pipes. Argilla Nigra. L.

5. BLUE CLAY.

Vast strata

very tough

heavy

very ductile

LEAD
COLOUR

reddens in
the fire

Leicester-
shire

Argilla
Communis.
L.

tiles.

6. POT CLAY.

Vast strata

tough

heavy

ductile

GREY

reddens in
the fire

Warwick-
shire

Argilla
Figulina.
L.

pots and pans.

7. PORCELANE CLAY.

Vast strata

brittle

heavy

not very
ductile

WHITE,
WITH
SPANGLES

dry

China

Argilla
Porcellana.
L.

porcelane.

8. YELLOW CLAY.

Vast strata

brittle

very
heavy

ductile
when wet

YELLOW,
WITH
SPANGLES

dry

China

Argilla
Chinensis.

coarse porcelane.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. LEMON CLAY.							
Vaſt ſtrata	tough	heavy	very ductile	VERY PALE YELLOW	unctuous	Taſſary	great pipe heads. Argilla Lithomarga. W.
10. DUSKY CLAY.							
Vaſt ſtrata	tough	heavy	very ductile	BROWNISH YELLOW	fatty, but coarſe	England	bricks. Argilla Sterilis. L.
11. RED CLAY.							
Thin ſtrata	brittle	heavy	ductile	PALE RED	dry	Sweden	Argilla Incarnata. L.
12. GREEN CLAY.							
Thin ſtrata	crumbly	light	not very ductile	COARSE GREEN, WITH SPANGLES	duſty	Ægypt, Germany	Argilla Talcosa. L.

13. TAWNY CLAY.						Argilla Tumescens. L.
Vast strata	spungy	heavy	not very ductile	REDDISH YELLOW	fandy	Wiltshire
						poor pottery.
14. DARK CLAY.						Argilla Grandæua. L.
Vast strata	hard	heavy	crumbly	DEEP BROWN	full of small gra- vel	Worcester- shire
						for ovens.
15. STAINING CLAY. UMBER.						Argilla Umbra. L.
Great masses	brittle	light	crumbly	DUSKY BROWN	stains the fingers	Italy
						for painting.
16. ÆGYPTIAN CLAY.						Argilla Nilotica. L.
Vast cakes	brittle	heavy	crumbly	LIGHT BROWN	dufty	Ægypt
						a manure.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. UNDERBOG CLAY.							
Thick strata	tough	heavy	ductile	BLACKISH	styptic	Ireland	Argilla Vitriolica. L.

I have taken the Linnaean trivial names for Clays; for no author has understood their characters so clearly and distinctly: but the list is smaller here; for his 6th, 8th, and 14th, are Boles; his 7th, 17th, and 20th, Marles. These will be found in their places; but excepting for this mixture, which my specimens disclaim, his distinctions are excellent: and 'tis the purpose here to give, that author's names, who appears to have understood the particular body best; to use not one, but all; and give a short direction where 'tis best to seek farther accounts, than the nature of this work admits.

E A R T H S.

O R D E R II.
C H A L K S.

C R E T A E.

Dry, dusty, light, brittle, staining masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE CHALK.							
Vast strata	hard	heavy	compact	WHITE	hardest, as deepest	England	for lime. Calx Creta. L.
2. DUSTY CHALK.							
Vast masses	crumbly	heavy	brittle	WHITE	foul with stones	Sweden	a manure. Calx Marmorea. L.
3. YELLOW CHALK.							
In great masses	brittle	heavy	dufty	YELLOWISH	foul with stones	Sweden	a manure. Calx Marmorea Flava. L.
4. RUDDY CHALK.							
Vast lumps	hard	very heavy	brittle	REDDISH	sandy	Forest of Dean	lime. Calx Marmorea Rubra. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. AGARICK CHALK.							
Flat, great cakes	soft	light	friable	PURE WHITE	stainy	Sweden	Calx Palustris. L. white washing.
6. MOON CHALK.							
LAC LUNÆ.							Calx Guhr. L.
Great lumps, deep in rocks	very soft	very light	very brittle	PURE WHITE	stainy	Germany	an absorbent.
7. RED CHALK.							
Large, rude masses	hard	very heavy	brittle	FINE RED	stains	Germany	Creta Rubens. W. for painting.

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Tender, crumbly, light, coarse masses.

N

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE MARLE.							
Vast strata	soft	light	very crumbly	PURE WHITE	breaks swiftly in water	England	manure. Argilla Marga L.
2. SALINE MARLE.							
Vast loose strata	brittle	heavy	crumbly	BROWN	salt taste	Palæstine	Argilla Muriatica, L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. CHINA MARLE.							Terre à Porcelane. W.
Vast masses	compact	heavy	coarse, and uneven	WHITE LIGHT GREY	full of spangles	China	porcelane.
4. CHALKY MARLE.							Marne Cretacee. W.
Vast strata	firm	heavy	uneven	YELLOWISH WHITE	cleansing for woollen	Greece	for the fullers.
5. FULLER'S MARLE. FULLER'S EARTH.							Argilla Fullonica. L.
Vast masses	soft	heavy	irregular	OLIVE- BROWN	most unctuous	England	for clothiers.
6. WHITE FULLER'S EARTH.							Smectis Grisea. W.
Thick strata	hard	heavy	glossy	GREYISH WHITE	soft	Germany	for cloaths.

Marge
Rouge.
W.

Deep strata

hard

light

rugged

RED

breaks
easily in
water

England

manure.

8. BROWN MARLE.

Marge
Fusca.
W.

Vast strata

tender

light

uneven

BROWN,
MIXED
WITH GREY
AND
YELLOWbreaks
freely

England

manure.

9. DOVE MARLE.

Marge
Columbina.
W.

Vast strata

hard

heavy

rough

DOVE CO-
LOUR, WITH
RED AND
BROWN
SPOTSbreaks
freely

England

manure.

10. YELLOW MARLE.

Marge
Flava.
W.

Deep strata

tender

light

dufty

DEAD
YELLOWbreaks
freely

England

manure.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
11. BLUE MARLE*. Vast strata	hard	heavy	shattery	DEAD BLUE, SIMPLE, OR VEIN'D	breaks slowly	England	Marga Cerulea. W. manure.
12. BLACK MARLE. Great masses	tender	heavy	crumbly	BLACK	breaks freely	England	Marga Nigricans. W. manure.
13. STEEL MARLE. Great lumps	hard	light	shattery	DEEP GREYISH	breaks in dice	England	Marga Ferreca. manure.
14. PAPER MARLE. Thin flakes	soft	light	filfile	PALE GREY	splits into leaves	England	Marga Papyracea. manure.

Marga
Tephacea,
L.

manure.

Holland

splits

WHITE

brittle

light

soft

Deep strata

15. SCALY MARLE.

Marga
Conchacea,
L.

manure.

England

crumbly

WHITISH

very
brittle

light

tender

Thick strata

16. SHELL MARLE.

Marga
Lapidifica,
W.

manure.

England

firm

PALE
BROWN

stony

heavy

hard

Vast strata

17. SAND MARLE.

Marga
Tephacea,
W.

manure.

Holland

crumbly

DEEP
BROWN

rugged

light

tender

Vast
lumps

18. CLUSTER MARLE.

* There is evidently, Clay in this Marle; and Cronstedt has great reason on his side, when he calls Marle a mixture of calcarious and clayey Earth.

calculations and cycles of time

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FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. PENDRITE MARLE. Thin strata	hard	heavy	uneven	PALE GREY	mark'd with figures of moffes	Germany	Marga Dendrites. W. manure.
20. SHELL MARLE*. Vast strata	tender	light	rugged	BROWN, AND WHITE	full of shells	Woolwich	Marga Immatura. manure.

* Many of the Marles have frequently Shells in them; but this is almost composed of them. 'Tis a doctrine, that all Marles are formed of decayed Shells; and this is, by those authors, supposed yet imperfect, or unripe: but there are Marles that have nothing shelly in them.

E A R T H S.
R D E R IV.
M O U L D S.

Impure, crumbly, light, mixt Earths.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PURE MOULD.							
A loose dust	tender	very light	smooth	PALE BROWN	impalpa- ble	every where	the food of ve- getables. Humus Dedalea. L.
2. DUSKY MOULD.							
A coarse dust	soft	light	uneven	DEEP BROWN	granulated	every where	the bed of plants. Humus Rurais. L.
3. LAKE MOULD.							
Deep beds	very soft	heavy	smooth	BLACKISH	impalpa- ble	under water	rich manure. Humus Lacustris Lutum. Cronstedt. L.
4. RED MOULD.							
Thick strata	tender	heavy	rugged	DUSKY RED	crumbly	Northamp- tonshire	rich land. Terra Adamica. W. Humus Damascena. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. HEATH MOULD. Deep beds	hard	light	uneven	DEAD BROWN	barren	on heaths	none. <i>Humus Pauperata. L.</i>
6. LOOSE MOULD. superficial beds	tender	light	uneven	BLACKISH	swelling with wet	in gardens	throws up roots <i>Humus Effervescens. L.</i>
7. PINGY MOULD. Deep beds	tender	light	smooth	UMBER- COLOUR'D	wet	on mountains	bed of Alpine plants <i>Humus Alpina. L.</i>
8. TURF MOULD. Deep beds	tender	light	rudded	RUDDY BROWN	mixt with roots and bitumen	in bogs	for firing. <i>Humus Turfa. L.</i>

9. IRON MOULD.

Thick beds tender heavy

10. BLACK MOULD.

Superficial strata tender heavy

11. SLATE MOULD.

Superficial strata hard heavy

12. STAINING MOULD.

Great lumps soft light

smooth

rugged

plated

crumbly

INKY

DEEP
BLACK

RUDDY
BROWN

BLACK

vitriolic

hardens in
air

effile

stains like
chalk

Sweden

England

England

Sweden

for dying black.

a rich land.

an alum ore.

for colouring.

Humus
Tinctoria.

Humus
Picea.
L.

Humus
Schistosa.
L.

Humus
Nigrica.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. RAVEN EARTH.							
Great masses	hard	heavy	uneven	RAVEN GREY	crumbly	Sweden	Humus Lenticularis. L.
14. ANIMAL EARTH.							
Dust	soft	light	even	BROWN	tender	church-yard	Humus Animalis. L.

E A R T H S.

O R D E R V.

B O L E S.

Smooth, soft, heavy, unctuous, tender masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE BOLE ARMENIC.							
Thick lumps	firm	very heavy	polished	PURE WHITE	melts in the mouth	Armenia	Argilla Bolus. L. Bolus Alb. H. a medicine for fluxes.
2. BRITTLE WHITE BOLE.							
Thin strata		heavy	dufty	WHITE	unctuous	Germany	Bolus Friabilis. H. a medicine for poison.
3. GREY BOLE.							
Vast masses	hard	heavy	smooth	GREYISH WHITE	crumbly	Greece	Bolus Eretria. H. Bol Gris. W. a medicine.
4. YELLOW BOLE ARMENIC.							
Thick strata	tender	heavy	polished	PALE YELLOW	melts in the mouth	Greece	Bolus Armena Galeni. H. a medicine for fevers.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. BOLE OF BLOIS.							
Thick masses	soft	light	dufty	GOOD YELLOW	melts in the mouth	Blois and Tokay	an astringent. Bolus Blesensis. H.
6. YELLOW LEMNIAN EARTH.							
Thick cakes	very hard	heavy	dufty	FULL YELLOW	breaks in flakes	Greece	an astringent. Terra Lemnia Flava. H.
7. ORANGE BOLE.							
Thick cakes	tender	light	smooth	REDDISH YELLOW	melts in the mouth	Livonia	for fevers. Terra Sigillata * Livonica Lutea. H.
8. RED BOLE ARMENIC.							
Deep strata	very hard	heavy	dufty	DEEP YELLOWISH RED	sticks to the tongue	Armenia	for fluxes. Bolus Rubra Durissima. H.

9. RED FRENCH BOLE.

Bolus Rubra
Gallica.
H.

Thick strata

tender

very
heavy

rough

PALE RED,
WITH YEL-
LOW VEINS

gritty

near Paris

for fluxes.

10. STRIGIA EARTH.

Terra Sigillata
Strigoniensis.
H.

Thick strata

tender

light

dusty

DULL RED

brittle

Hungary

for fevers.

11. TUSCAN BOLE.

Terra Sigillata Rubra
Magni Ducis.
H.

Vast masses

friable

very
heavy

irregular

PALE RED

gritty

Tuscany

for fevers.

12. RED LEMNIAN EARTH.

Terra Lemnia
Rubra.
H.

Thick strata

very hard

heavy

polished

DEEP RED

melts in
the mouth

Greece

for fevers.

* Many of these medicinal Earths come to us, seal'd; and there have been thought to be more than there really are: these seem, on a careful enquiry, to be all the truly distinct kinds.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
13. ALME RICA NIO L							
Vast lumps	very hard	heavy	uneven	FLESH-COLOUR'D	melts in the mouth	Virginia, and Carolina	astringent. Bolus Rubescens. H.
14. TRIPELA.							
Thin strata	hard	light	dufty	PALE RED	harsh, and gritty	Naples	for scouring. Argilla Tripolitana. L.
15. BROWN BOLLE.							
Large cakes	of firm	heavy	smooth	PALE BROWN	melts in the mouth	Goffelaer	an astringent. Bolus Fusca. H.
16. GREEN BOLLE.							
Small lumps	tender	very heavy	polished	DUSKY GREEN	melts in the mouth	Cornwall	astringent. Bolus Virescens. H. Bolus Viridis. W.

17. BLACK BOLE.

Vast lumps
very hard

18. DUSKY BOLE.

Thin cakes
hard

heavy
glossy

PERFECTLY
BLACK

bitumi-
nous

Germany

Le Bol
Noir.
W.

astringent.

heavy
rough

BLACKISH

green,
when
powder'd

Sweden

Bolus
Squamosa
Cronstedt.

an iron ore.

E

A

R

T

H

S.

O

R

D

E

V.

H V E D A E S S

I A E I C H A L

S O K E V S E

C O R O A S

S O V I L L E S

L F V C E

U 2 E 1

Dry, dusty, staining, fine masses.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. DUSTY WHITE OCHRE.							
Small pieces	friable	very heavy	dusty	PURE WHITE	crumbly	Sweden	a lead ore. Ochra Plumbi. L.
2. FIRM WHITE OCHRE.							
Small lumps	hard	very heavy	smooth	WHITE	stains the hands	Germany	a Zink ore. Ochra Zinci. L.
3. YELLOW OCHRE.							
Thin strata	soft	light	dusty	BRIGHT YELLOW	crumbly	England	a paint. Ochra Ferri. L.
4. TAWNY OCHRE.							
Great masses	tender	very heavy	uneven	TAWNY YELLOW	brittle	Sweden	a paint. Ochra Cobalti. L.

5. GOLD OCHRE.		light	rugged	BRIGHT YELLOW	crumbly	England	a paint.	Ochra Theophrasti. H.
6. SAFFRON OCHRE.								
Thin masses	tender							
7. NAPLES OCHRE.		light	uneven	SAFFRON YELLOW	flaky	Northamp- tonshire	a paint.	Ochra Attica. H.
Flat cakes	brittle							
8. RED OCHRE.		heavy	rugged	FINE YELLOW	crumbly	Italy	a paint.	Ochra Giallolina. H.
Large lumps	brittle							
9. RED OCHRE.		very heavy	uneven	STRONG RED	crumbly	England	a coarse paint.	Ochra Sil Syriacum H.
Vast cakes	brittle							

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. PURPLISH OCHRE.							
Great lumps	tender	very heavy	dufty	PURPLISH RED	friable	Spain	a paint. Ochra Sil Atticum. H.
10. CRIMSON OCHRE.							
Great cakes	hard	extreamly heavy	uneven	DEEP PURPLISH CRIMSON	gritty	Isle of Ormuz	a paint. Ochra Purpurea. H.
11. VENETIAN OCHRE.							
Great cakes	tender	light	dufty	PALE RED	perfectly pure	Venice	a paint. Ochra Veneta. H.
12. SINOPIC OCHRE.							
Thick masses	compact	very heavy	smooth	DEEP RED	soft to the touch	Greece	a paint. Ochra Sinopica. H.

13. RED CHALK OCHRE.

Great masses very hard heavy

polished

GOOD RED

unctuous

Italy

a paint.

Ochra
Creta Rubra.
H.

14. MARBLE OCHRE.

Great masses stony hard heavy

uneven

STRONG
RED

duffy

China

a paint.

Ochra Sil
Marmorosum.
H.

15. RUSTY OCHRE.

Small cakes tender very heavy

rough

RUST CO-
LOUR,
BROWN,
RED

green,
when
dissolv'd

Sweden

a copper ore.

Ochra
Cupri.
L.

16. GRAIN'D RED OCHRE.

Small lumps soft very heavy

rugged

RUSTY RED

granulat-
ed, and
thready

Sweden,
in iron mines
and on iron

a paint.

Ochra
Ferrugos.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. STREAKY RED OCHRE.							
Small lumps	tender	heavy	fibrous	PALE RED	plumose	France	a paint. Ochra Stibigo. L.
18. GREEN OCHRE.							
Small maffes	friable	light	granulated	GOOD GREEN	dufty	Germany	a paint. Ochra Æris. L. Ochra-Chryfocolla. H.
19. CHRYSOLITE OCHRE.							
Rough lumps	brittle	heavy	uneven	YELLOWISH GREEN	green, when diffolv'd	Sweden	a paint. Ochra Nickeli. L.
20. FIBROUS GREEN OCHRE.							
Small maffes	tender	light	rugged	PALE GREEN	crumbly	Virginia, on copper ore	a paint. Ochra Ærugo. L.

21. SOFT BLUE OCHRE.

Great lumps friable heavy

LIGHT
BLUE

hiffes in
water

Germany

a paint.

Ochra Lapis
Armenus.
H.

22. HARD BLUE OCHRE.

Small lumps hard heavy

GOOD
BLUE

earthy

Sweden

a paint.

Ochra
Cupri.
L.

23. STRIATED BLUE OCHRE.

Great lumps tender very heavy

FINE BLUE

fibrose

Germany

a paint.

Ochra
Cuprigo.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	Uses.
24. BLACK OCHRE.							Ochra Magnetia. C. L.
Great masses	tender	light	uneven	BLACKISH	crumbly	Leicester- shire	a paint.
25. FIBROSE BLACK OCHRE.							Ochra Argentinos L.
Small lumps	hard	very heavy	freaky	DEEP BLACK	thready	Saxony	a silver ore.
26. BLACKISH TRIPELANE OCHRE.							Ochra Tripela Fusca. H.
Great masses	hard	heavy	uneven	BLACKISH, OR BROWN	dufty	Warwick- shire	for polishing.

P A R T II.

COMPOUND FOSSILS.

Form'd by mixture of two, or more of
the Native, Earthy kinds.

C L A S S I.

S E M I - P E L L U C I D G E M S.

Hard, heavy, rounded masses: rude on the surface,
smooth where broken, and composed of impercep-
tible particles.

THESE do not ferment with Acids: they strike
fire with steel, and they take a delicate polish.

They all encrease in weight by calcination; in the
manner of Lead, and some other metals. 'Twas Hen-
kel first astonished the world with this account: and
by repeated trials, I have found it true, but in va-
rious degrees.

They all run in the fire, and make glafs; to this
purpose those serve best which have least colour, or
come nearest to pure Crystal. Cronstedt says, there
are kinds which make a glafs, that is injured by Acids;
and those so weak, as what are in the Rhenish and
Moselle wines.

COMPOUND FOS SIL S.

ORDER I.

OPAL S.

Uniform, almost pellucid, varying the shades of colours with the light.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE OPAL.							
Small lumps	hard	heavy	raised in lumps	PALE, AND CHANGE-ABLE	almost transparent	India, Ægypt	ornament. Silex Opalus. L.
2. WHITE OPAL.							
Larger lumps	soft	light	uneven	MILKY, AND CHANGE-ABLE	opaque	Arabia	ornament. Opalus Albus. Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
(1. WORLD'S EYE.							
Small masses	hard	heavy	irregular	GREYISH, BROWN	transpa- rent, in water	East Indies	ornament.
							Silex Oculus Mundi. L.

COMPOUND FOSSILS.

ORDER II.

ONYXES.

Plated, opake, variously coloured, in distinct beds.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. A R A B I A N O N Y X.							
Small lumps	hard	heavy	warted	BLUEISH GREY	beds of black and white	East Indies	rings.
2. B R O W N O N Y X.							
Larger lumps	hard	heavy	tabulated	GREY	beds of dead brown	Conanor	ornaments.
3. C A M E A N O N Y X.							
Small lumps	hard	heavy	tilly	BLACK, AND WHITE	separate thick beds	East Indies	for engraving gems.
4. S A R D O N Y X.							
Small lumps	hard	heavy	undulated	RUDDY, BROWNISH	beds of white	Ægypt	for gems.

Onyx
Corneus.
W.Onyx Circulis
Fuscis.
W.Onyx
Memphites.
W.La Sardonyx.
W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. SIBERIAN ONYX.							
Small lumps	very hard	heavy	uneven	GREY	veins of flesh- colour	river Tomin, Siberia	Onyx Carnea Crownsteds. ornaments.

COMPOUND FOSSILS.

ORDER III.

JASPOONYXS.

Opake of various colours, in thick veins, blotches, or spots: not in plates.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CLOUDED JASPONYX.							
Large lumps	hard	heavy	wav'd, and warted	PALE RED	grey, cloudy within	Arabia	boxes.
2. SPOTTED JASPONYX.							
Small maffes	tender	heavy	rugged	DULL GREEN	spots of pale red	Ægypt	snuff boxes.

Jasponyx
Capnias.
W.

Jasponyx
Mouchette.
W.

COMPOUND FOSSILS.

ORDER IV.

CHALCEDONY.

Dusky, clouded, and mixed of various colours.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. GREENISH CHALCEDONY.							
Little lumps	very hard	heavy	coated.	GREYISH GREEN	uneven veins	Ægypt	snuff boxes. Silex Chalcedonius. L. Chalcedonius Griseo Spadicceus, W.
2. BROWN CHALCEDONY.							
Large lumps	hard	heavy	wav'd	BROWNISH GREY	clouded	Ægypt	ornament.
3. RAINBOW CHALCEDONY.							
Small masses	soft	heavy	botryoid	BLUEISH GREY	red, green, yellow rainbows	East Indies	toys.
4. MILK CHALCEDONY.							
Great lumps	soft	heavy	scaly	MILKY	thin. clouds of grey	Tartary	for idols. Chalcedonius Cocholong Cronstedt.

5. BLUE CHALCEDONY.

Large lumps | hard | heavy

GREYISH
BLUE

unspotted

Ceylon,
Siberia

Chalcedonius
Cæruleus
Cronstedt.
ornament.

6. LINEATED CHALCEDONY.

Large lumps | hard | heavy

YELLOWISH

lines and
spots of all
colours

East Indies

Chalcedonius
Lineatus.
W.
ornament.

COMPOUND FOSSILS.

OR DER V.

CHALCENECOLIAN S.

Tolerably pellucid, pure, or veined in circles, not in beds.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. RED CARNELIAN.							
Large lumps	hard	heavy	crusted	PALE RED	without veins	Arabia	toys. Silex Carneolus. L.
2. WHITE CARNELIAN.							
Large lumps	hard	heavy	smooth	MILKY WHITE	cloudy	Ægypt	toys. Carneolus Albescens. W.
3. YELLOW CARNELIAN.							
Small masses	tender	heavy	warted	AMBER- COLOUR'D	dusky	Ægypt	toys. Carneolus Flavescens Cronstedt.
4. BROWN CARNELIAN.							
Small lumps	hard	heavy	crusted	PURE BROWN	cloudy	Siberia	toys. Carneolus Flavofuscus Cronstedt.

5. BLOODY CARNELIAN.

Beryllus
Scheukzer.
W.

Small lumps | very hard | heavy

smooth

clear

East Indies

a jewel.

6. DOTTED CARNELIAN.

Carneolus
Stigmatites.
W.

Small lumps | very hard | heavy

warted

WHITISH
RED

spots of
blood red

East Indies

ornament.

7. VEINY CARNELIAN.

Carneolus
Lineatus.
W.

Small lumps | tender | light

smooth

PALE RED

veins of
deep red

Arabia

ornament.

COMPOUND FOSSILS.

ORDER VI.

AGATES.

Clear, hard, veined, flinty, and rugged on the surface.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. GREY AGATE.							
Large lumps	very hard	heavy	raised in round bumps	GREY	veins of black and white	Germany	for toys.
2. BROWN AGATE.							
Small lumps	very hard	very heavy	warted	DEEP BROWN	vein'd with grey and white	Italy	for toys.

Achates Durissima. W.

Achates Fusca. W.

3. MILK AGATE.

Large lumps

hard

raised in
lumps

MILKY
GREY

concentric
circles of
white

Africa

for toys.

Achatés
Chalcédoniens
Orrhéed.

4. BLACK AGATE.

Small lumps

hard

very
heavy

botryoide

BLACK,
WITH PALE
VEINS

keeps its
colour in
the fire

Germany

toys.

Achatés
Niger.
W.

5. DOTTED AGATE.

ST. STEPHEN'S GEM.

Small masses

soft

very
heavy

rough

PALE GREY

red dots,
and
freaky

Italy

toys.

Silex
Sardus.
L.

6. TAWNY AGATE.

Large lumps

hard

heavy

botryoide

PALE
BROWNISH
YELLOW

undulated

Germany

toys.

L'Agate
Leontine.
W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
7. H Y E N A A G A T E.							
Large lumps	hard	heavy	rugged	OLIVE BROWN	sinoaky	Germany	toys. L'Agate Hyanc. W.
8. P A N T H E R A G A T E.							
Large lumps	very hard	heavy	grape like	YELLOWISH	dufky spots	Palatinate	toys. L'Agate Peurthere. W.
9. W H I T E V E I N ' D A G A T E.							
Large masses	very hard	heavy	bubbly	DEEP BROWN	white veins	Hartz forest	toys. Achates Variegatus Cronstedt.
10. V I O L E T A G A T E.							
Small lumps	hard	heavy	warted	VIOLET PURPLE	dufky veins	Germany	toys. Achates Vio'aceus Cronstedt.

11. BLOOD AGATE.

Small lumps soft heavy

bumps,
and rifings

BLACK

blood red
spots

Germany

toys.

Achates
Hemachate.
W.

12. FLESH AGATE.

Small lumps hard heavy

waved

GREY

flesh-
colour'd
spots

Oberstein

toys.

Achates
Sardachates.
W.

13. GREEN AGATE.

Large lumps soft heavy

warted

PALE
GREEN

red spots

Germany

toys.

Achates
Jaspachates.
W.

14. ORANGE AGATE.

Large lumps hard very
heavy

crusted,
and rough

DUSKY
YELLOW

black, red,
and green
veins

Germany

toys.

Achates
Quadricolor.
W.

COMPOUND FOSSILS.

ORDER VII. M O C C O A S.

Semipellucid, smooth, very hard, with black delineations.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CLEAR M O C C O A.							
Small lumps	very hard	heavy	smooth	COLOUR- LESS	with black mosses	East Indies	L'Agate Coralline. W. ornament.
2. BROWN M O C C O A.							
Small lumps	hard	heavy	uneven	PALE BROWN	figures of trees	East Indies	Dendrachates Woodward. ornaments.

Achatas
Mocoensis.
W.

3. WHITE MOCOAS.

Small lumps	hard	heavy	botryoid	WHITISH, OR MILKY	forms of silver ores	Germany *	ornament.
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* Wonders have been related of these Mocoas; but they have been fictitious: we have been astonished with the forms of fun, moon, and stars; the shapes of Insects, the arms of nations, and, even human figures: but when we know that a solution of silver will follow a tool, and give any delineations we please on Stones, of this quality, we find the origin of these more than natural productions. Mocoas may be made thus, with pretty figures, like the natural, as well as with romantic follies; and 'tis strange, that when the lines decay, and begin to disappear, laying the Stone in the sunshine recalls them.

Linnæus does not distinguish the Mocoa from the Agate; and Wallerius enumerates those with forms of crowns, and human figures, and the like: but the fact is, the Mocoa differs from the Agate; for it is harder; but the colours of the Stone, not the delineations, are to mark the different kinds.

COMPOUND FOS SILS.

ORDER VIII.

SWALLOWSTONES.

Small, rounded, or oval, smooth.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CONVEX SWALLOW STONE.							
Low raised	tender	heavy	polished	PALE BROWN	concave below	Germany	Hirondelle Concave. W.
2. HIGH SWALLOW STONE.							
Raised high	hard	heavy	botryoide	WHITISH	hæmi- sphere	Saxony	Hirondelle Demisphærique. W.
3. CRAB'S EYE SWALLOW STONE.							
Oval	hard	heavy	polished	GREY	in lumps of Agate	Germany	Hirondelle Ovale. W.
4. CORNER'D SWALLOW STONE.							
Square	soft	light	rugged	MILKY	hollowed below	Germany	Hirondelle Quarré. W.

COMPOUND FOSSILS.

ORDER IX.

JASPER S.

Opake, rough, in vast masses.

I. PLAIN JASPER S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
1. GREY JASPER.							Silex Jaspis. L.
Vast masses	hard	very heavy	rugged	DULL GREY	breaks like flint	Sweden	
2. WHITE JASPER.							Petroflex Albus. W.
Great masses	very hard	heavy	uneven	FINE BLUEISH WHITE	polishes finely	Germany	

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. RED	JASPER.						
Great pebbles	hard	heavy	even	RED	glossy	gravel pits in England	Homochroum Rubens. H.
4. YELLOW	JASPER.						
Vast blocks	very hard	heavy	rugged	PALE YELLOW	sparkling	Hampstead-heath	Jaspis Flava. W.
5. IRON	JASPER.						
Rounded lumps	hard	very heavy	smooth	BRIGHT IRON GREY	flinty	Germany	Jaspis Martialis Cronstedt.
6. BROWN	JASPER.						
Rugged lumps	very hard	very heavy	wrinkled	DEAD BROWN	shining	Sweden	Jaspis Spadicea. W.

Jaspis
Aerizusa
Plin.i.

Homochroum
Virefcens.
H.

Jaspis
Nigra
Cronstedt.

Jaspis
Virens
Cronstedt.

7. BLUE JASPER.	Rounded lumps	hard	very heavy	glossy	FINE BLUE	flinty	Italy	Jaspis Aerizusa Plin.i.
8. GREEN JASPER.	Rounded lumps	hard	heavy	smooth	DULL GREEN	marbly	Suffex	Homochroum Virefcens. H.
9. BLACK JASPER.	Vaft rocks	very hard	heavy	uneven	PERFECTLY BLACK	ftony	Germany, Sweden	Jaspis Nigra Cronstedt.
10. GREEN AND YELLOW JASPER.	Small maffes	hard	very heavy	smooth	GOOD GREEN	yellow spots	Bohemia	Jaspis Virens Cronstedt.

J A S P E R S.

V E I N ' D

2.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
II. BLOODSTONE JASPER.							
Small lumps	hard	heavy	smooth	BLUEISH GREEN	blood red spots	Ægypt	Jaspis Heliotropium Cronstedt.
12. YELLOW AND WHITE JASPER.							
Great blocks	very hard	heavy	crack'd, and flaw'd	PEARLY WHITE	yellow blotches	Germany	Jaspis Variegata Albescens. W.
13. RED AND BLACK JASPER.							
Large lumps	hard	very heavy	raised in bumps	BLOOD RED	green and black spots	Italy	Diaspro Rosio Cronstedt.
14. RED AND YELLOW JASPER.							
Small blocks	very hard	heavy	perfectly even	DUSKY RED	yellow veins and spots	Ægypt	Diaspro Florida Cronstedt.

15. BROWN AND WHITE JASPER.

Large lumps | hard | very heavy

16. PANTHER JASPER.

Great lumps | less hard | heavy

17. GARAMANTINE JASPER.

Small lumps | very hard | heavy

18. AZURE JASPER.

Small lumps | hard | heavy

PALE
BROWN

uneven

white
blotches

Germany

Jaspis
Variegatafulca.
W.

GREEN

uneven

yellow
and red
blotches

Germany

Jaspis Variegata
Viridis.
W.

DEEP RED

glossy

white
blotches

Ægypt

Jaspis Lincis
Albis.
W.

FINE BLUE

crack'd

yellow and
white
veins and
spots

Arabia

a copper ore.

Lapis
Lazuli.
W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
19. ARMENIAN JASPER.							
Small masses	less hard	heavy	smooth	LIGHT BLUE	white spots	Ægypt	Lapis Armenus. W.
20. SAPPHIRINE JASPER.							
Small masses	hard	heavy	glossy	DEEP BLUE	gold dots	East Indies	Lapis Radianus. W.
3. R O C K J A S P E R S.							
21. BROWN ROCK JASPER.							
Whole strata	hard	very heavy	rugged	PALE BROWN	flinty	Germany	Petrofiliæ Lucidofuscus. W.
22. UMBER ROCK JASPER.							
Whole rocks	tender	heavy	wavy	DEEP BROWN	glassy	Sweden	Petrofiliæ Obscurofuscus. W.

23. VEIN'D ROCK JASPER.		heavy	rugged	GREENISH	brown veins	Germany	Petroflox Venosus. W.
24. SAND JASPER.		hard					
Vaft maffes	lefs hard	very heavy	rough	RUDDY BROWN	white and yellow dots	Italy	Petroflox Arenaceus. W.
25. PEARLY AGATE JASPER.							
Great rocks	very hard	very heavy	rugged	WHITISH	white lines	Germany	Petroflox Semipellucidus. Albus. W.
26. RED AGATE JASPER.							
Great maffes	hard	heavy	uneven	PALE REDDISH	duffy spots	Germany	Petroflox Semipellucidus Rufescens. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
27. VEIN'D AGATE	JASPER.						
Great masses	very hard	heavy	smooth	BROWNISH	white and red veins	Bohemia	Petrofalex Semipellucidus Venosus. W.
28. PEACOCK AGATE	JASPER.						
Great blocks	less hard	very heavy	bubbled	RUDDY	black and yellow veins	Germany	Petrofalex Semipellucidus Variegatus. W.

COMPOUND FOSSILS.

ORDER X.

PEBBLES.

Rounded, hard masses, covered with a crust, and formed of circular coats, round a central nucleus.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. RED AND WHITE PEBBLE.							
Oval	hard	heavy	rugged	NUCLEUS YELLOW	crusts red and white	Hampstead- heath	Calculus Albo Rubens. H.
2. BLACK AND WHITE PEBBLE.							
Round	hard	heavy	uneven	NUCLEUS TAWNY	crusts black, white, yellow	Kenfington	Calculus Nigro Albus. H.
3. BROWN AND WHITE PEBBLE.							
Oblong	hard	heavy	reticu- lated	LARGE BROWN NUCLEUS	crusts white and brown	Hertford- shire	Calculus Fusco Albus. H.
4. BLUE AND RED PEBBLE.							
Round	hard	heavy	smooth	LARGE GREY NUCLEUS	red, blue, and brown crusts	Windfor	Calculus Cæruleo Rubens. H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. WHITE COATED PEBBLE.							
Uneven masses	hard	heavy	rugged	RED, WHITE, AND BROWN	a thick white crust	Hampstead	Calculus Corticofus. H.
6. BLUSH AND WHITE PEBBLE.							
Round	hard	heavy	wrinkled	NUCLEUS BLUEISH	thin crusts of two reds, white and yellow	Hertford- shire	Calculus Rosaceus. H.
7. PURPLE PEBBLE.							
Oval	hard	heavy	smooth	NUCLEUS FLESH- COLOUR'D	crusts purple and yellow	Hampstead	Calculus Purpurascens. H.
8. MAGPYE PEBBLE.							
Oval	hard	heavy	wrinkled	NUCLEUS BLACK	crusts black and white	Leicester- shire	Calculus Macularius. H.

9. GREEN AND WHITE PEBBLE.			Calculus Albo Virens. H.			
Round	hard	heavy	uneven	NUCLEUS GREY	crusts white and green	Northamp- tonshire
10. RAINBOW PEBBLE.			Calculus Vericolor. H.			
Round	hard	heavy	smooth	NUCLEUS SMALL AND RUDDY	thin crusts of all colours	Leicester- shire
11. ÆGYPTIAN PEBBLE.*			Calculus Ægyptiacus. H.			
Oblong	hard	heavy	wrinkled	NUCLEUS BROWNISH WHITE	crusts tawny, brown, and black	Ægypt
12. BROWN AND YELLOW PEBBLE.			Calculus Fuscoslavus. H.			
Oval	hard	heavy	smooth	NUCLEUS GREEN	crusts brown and yellow	Hampstead

* The Ægyptian Pebble is eminent for its Mocoa-like variegations; and for the more than ordinary oddities of its veins and spots. Few Fossils require more care in the distinction than the English Pebbles. I once thought them more numerous; but these seem, on strict enquiry, all the true kinds.

COMPOUND FOS SILS.

ORDER XI.

FLINTS.

Opake, glossy, solid, and of one colour and substance.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
1. CHALK FLINT.							
Uneven masses	very hard	heavy	rough, white coated	DUSKY	horn-like	chalk-pits	gun flints, and glafs.
2. OIL FLINT.							
Great lumps	hard	heavy	naked, and smooth	OLIVE- COLOUR'D	oily	France	gun flints.
3. GREY FLINT.							
Vast lumps	very hard	heavy	smooth, brown coated	GREY	glossy	Sweden	gun flints.

Silex
Cretacus.
L.

Silex
Pyromachus.
L.

Silex
Marmoreus.
L.

COMPOUND FOSSILS.

CLASS II.

STONES.

Formed into whole strata; composed of two, or more of the native earthy Fossils.

ORDER I.

EARTHY STONES.

Composed of hardened Earths, with Saline, or other mixtures.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. O I L S T O N E.							
Thick plates	soft	heavy	smooth	BLACK	fine	Germany	* Schist ^{us} Novacula. L. for whetstones.
2. S L A T E S T O N E.							
Thin plates	hard	heavy	scaly	RAVEN GREY	easily mark'd	Germany	Schist ^{us} Tabularis. L. slates for writing.
3. B R I T T L E S L A T E.							
Thick plates	tender	light	dufty	BLACK	crumbly	Sweden	Schist ^{us} Atratus. L.
4. G R E E N S L A T E.							
Coarse plates	soft	heavy	rugged	GREYISH GREEN	brittle	Germany	Schist ^{us} Viridis. L.

5. BLUE SLATE.	Fine plates	hard	heavy	even	BLUE GREY	firm	England	for flating houfes.	Schifus Ardefia. L.
6. PURPLE SLATE.	Thick plates	hard	light	fcaly	PURPLE	brittle	England	for houfes.	Schifus Purpurafcens. H.
7. SOUNDING SLATE.	Fine plates	very hard	heavy	fmooth	BLACK	founds when ftruck	England	for houfes.	Schifus Solidus. L.
8. CLAY SLATE.	Thick ftrata	foft	light	rugged	YELLOWISH GREY	crumbly	Sweden		Schifus Argillaceus. L.

* Excellent Linnæus ! fo diftinct and perfect in thefe Stones, little remains for others, but to copy him.

F O R M.	H A R D N E S S.	W E I G H T.	S U R F A C E.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
9. WHITE MARLE SLATE.							
Vast strata	very soft	light	scaly	PURE WHITE	shattery	England	manure. Schistus Albus. H.
10. GREY MARLE SLATE.							
Thick beds	soft	heavy	uneven	DEAD GREY	crumbly	England	manure. Schistus Margaceus. α L.
11. GREEN MARLE SLATE.							
Deep strata	hard	heavy	rugged	GREENISH	breaks in the air	England	manure. Schistus {Margaceus. β L.
12. RUDDY MARLE SLATE.							
Thick strata	very hard	heavy	scaly	REDDISH	breaks in the air	England	manure. Schistus Margaceus. γ L.

13. STAINING SLATE.							Schistus Nigrica.
Coarse beds	soft	light	flaky	DEEP BLACK	stains the hands	Sweden	a coarse paint.
14. RAVEN SLATE.							Schistus Communis. L.
ALUM SLATE.							
Thick strata	hard	heavy	scaly	RAVEN GREY	firm	England	alum ore.
15. DOTTED SLATE.							Schistus Olearius. L.
Thick strata	hard	heavy	rough	RUDDY	brown spots	Sweden	whetstones.
16. LIMESTONE SLATE.							Schistus Efferveicens. L.
Vast strata	hard	heavy	scaly	PALE BROWN	gritty	Sweden	lime.
17. FLINTY SLATE.							Schistus Compactissimus. L.
Thick plates	very hard	very heavy	flaky	DARK GREY	compact	China	

* This often is rich in Alum; in which case it breaks into a kind of rhomboidal fragments, with sparkling surface.

COMPOUND FOSSILS.

ORDER II.

CRYSTALLINE STONES.

Composed of a crystalline matter; debased by earthy, and other mixtures.

THE distinction of these Stones is easy, and absolute: they are hard; they are glossy, when broken; they strike fire with steel; they are not affected by Acids; and they run to glass.

Where we see cracks, or hollows, in them, they are usually lined, or filled with shoots of pure Crystal; and of Crystal only. Spar has no place but in Sparry Stones.

4. GRIND.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. GRINDSTONE.							
Thick strata	hard	heavy	rugged	WHITISH	sandy	Germany	^{Cos} Cotaria. L. for grindstones.
2. CRACKSTONE.							
Vast strata	soft	heavy	crack'd	GREYISH	spangled	Sweden	^{Cos} Quadrum. L.
3. LIVERSTONE.							
Vast masses	tender	heavy	rugged	REDDISH BROWN	bounces in the fire	Sweden	^{Cos} Calcareo. L.
4. TYGERSTONE.							
Great masses	hard	heavy	uneven	RUDDY BROWN	white spots	Sweden	^{Cos} Tigrina. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. IRON STONE.							
Rude lumps	soft	lighter	bubbly	PALE BROWN	round rusty spots	Germany	an iron ore. Cos Variolosa. L.
6. HONEY STONE.							
Flat lumps	soft	heavy	smooth	PALE YELLOWISH BROWN	smooth	Arabia	for barbers hones. Cos Novacula. L.
7. WHITE SLATE STONE.							
Flat flakes	hard	heavy	rugged	WHITISH	fandy	England	for building. Cos Fissilis. L.
8. RED SLATE STONE.							
Thick plates	tender	very heavy	scaly	REDDISH	gritty, sparkling	England	for building. Cos Fissilis Rufescens. L.

9. CRUMBLY STONE.

Vast strata soft heavy

10. LOOSE STONE.

Great lumps brittle heavy

11. FILTERING STONE.

Thick lumps tender light

12. SMOOTH STONE.

Thick strata very hard heavy

rugged

gritty

cavernous

smooth

PALE

BRIGHT

PALE
BROWN

YELLOWISH
BROWN

hardens in
the air

of small,
clear
granules

lets water
pass thro'

granite
dots

England

Italy

Canaries

Germany,
Sweden

building.

glafs.

for filtering water.

grinding stones.

Friabilis,
L.

Cos
Coagmentata,
L.

Cos
Filtrum,
L.

Cos
Compacta.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
13. B R I G H T S T O N E.							
Vast strata	hard	heavy	regularly granulated	PALE BROWN	bright	England, Sweden	^{Cos} Strataria. L.
14. Y E L L O W S A N D S T O N E.							
Great strata	tender	heavy	fandy	YELLOW	even structure	Yorkshire	^{Cos} Colorata. α L.
15. G R E E N S A N D S T O N E.							
Vast masses	soft	very heavy	rugged	DULL GREEN	granulated	Germany	^{Cos} Colorata. β L.
16. B L A C K S A N D S T O N E.							
Great lumps	tender	heavy	uneven	BLACKISH	coarse	Sweden	^{Cos} Colorata. γ L.

17. PORCELANE STONE.

^{Cos}
Porcellana.
L.

Thick strata

hard

heavy

irregular

GREY

part
glossy

Sweden

18. MILL STONE.

^{Cos}
Molaris.
L.

Vast strata

hard

heavy

irregular

PALE
BROWN

mixture of
various
particles

England

for grinding corn.

19. ROUGH STONE.

^{Cos}
Fundamentalis.
L.

Vast strata

very hard

heavy

granulated

RUDDY

sharp
particles

Sweden

building.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
20. WHITE STONE.							
Vast strata	hard	heavy	rough	WHITISH	sharp particles	England	building. Cos Fundamentalis Alba. L.
21. PLATE STONE.							
Great lumps	very hard	heavy	smooth	PALE GREY	flinty, but gra- nulated	Germany	glafs. Quartzum Fifile. L.
22. SLAG STONE.							
Vast blocks	hard	very heavy	rugged	PALE BROWN	mixture of great and small grains	Sweden	glafs. Quartzum Cotaccum. L.

COMPOUND FOSSILS.

ORDER III.

SPARRY STONES.

Composed of Spar ; debased by earthy, and other mixtures.

THES E are soft, tender, and brittle ; they break irregularly ; they will not strike fire with steel ; and they ferment with Acids. The pure Spar in their construction, dissolves in these liquors ; and sometimes part of the debasing mixture, when Alkaline : the rest remains, and shews the mixt nature of the Stones.

'Tis from these residuums of the various Sparry Stones, washed clean, and examined by the microscope, we may, with truth and certainty, discover their nature and composition.

The cracks in these rocks always afford Spar, never Crystal ; therefore these crystalizations are of matter which was originally a part of the Stone itself, not brought from elsewhere.

The coarser Sparry Stones have been called, Limestone ; and the finer Marbles. The distinctive names shall be preserved here, tho' the distinction itself is vague. I have had some of our Limestones polished, as Marble, which all have call'd, and allowed to be Marble ; and many Marbles always called so, and acknowledged such, are burnt into lime ; especially the fragments, and the upper parts of the strata.

In all Limestones, Marbles, and even in Chalk, the upper part is softer, and coarser ; that which lies deeper, is harder, and finer.

COMPOUND FOS SILS.

I. LIMESTONES.*

Sparry Stones of a dull aspect.

I. OF A SMOOTH EVEN STRUCTURE.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE SMOOTH LIMESTONE.							
Great strata	tender	heavy	uneven	WHITISH	burns easily to lime	England	lime. manure.
2. YELLOW SMOOTH LIMESTONE.							
Vast masses	hard	heavy	smooth	PALE YELLOW	burns slowly	Venice	lime.

Lapis Calcareus
Æquabilis Albus.
W.

Calcareus Æ.
Flavus
Cronstedt.

3. RUDDY SMOOTH LIMESTONE.							Calcareus Æ. Rubens. W.
Thick strata	tender	light	rough	REDDISH BROWN	brittle	Sweden	lime.
4. RUSTY SMOOTH LIMESTONE.							Calcareus Ferrugineus Cronstedt.
Thin strata	hard	heavy	flaky	RUST COLOUR'D	glossy	Germany	lime.
5. GREY SMOOTH LIMESTONE.							Calcareus Griseus Cronstedt.
Vast masses	hard	light	rugged	BLUEISH GREY	firm	England	lime. manure.
6. GREEN SMOOTH LIMESTONE.							Calcareus Æ. Viridis. W.
Thick strata	very hard	heavy	irregular	GREENISH	burns quick	Prague	lime.

* Here Cronstedt takes the lead, as Linnaeus did in the preceding Order of the Crystalline Stones; the great Swede, not allowing the mineralists distinction, as of Species, but accounting them Varieties. 'Tis thus the Student in this abstruse science should act, always selecting the names of that author, who has been most distinctive; and adding, and reforming from his own store.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. IRON SMOOTH LIMESTONE.							
Large strata	very hard	very heavy	undulated	GLOSSY, IRON GREY	burns slowly	Germany	lime. Calcareus <i>Æ.</i> Ferrous. W.
8. BROWN SMOOTH LIMESTONE.							
Great lumps	hard	heavy	rugged	DEEP BROWN	burns difficultly	Dalecarlia	lime. Calcareus <i>Æ.</i> Fuscus. W.
9. BLACK SMOOTH LIMESTONE.							
Vast strata	soft	light	smooth	BLACKISH	burns easily	Germany	lime. Calcareus Niger Cronstedt.
10. MARBLED SMOOTH LIMESTONE.							
Thick strata	very hard	heavy	flaky	grey, ruddy, and other colours, mixed	bright	Germany	lime. Calcareus <i>Æ.</i> Venosus. W.

2. GRITTY LIMESTONES.

11. COARSE WHITE GRITTY LIMESTONE.

Vast strata

tender

light

granulated

DEAD
WHITE

large
grains

England

lime.
manure.

Calcareus Granulatus
Alb. 1.
Cronstedt.

12. FINE WHITE GRITTY LIMESTONE.

Great lumps

hard

heavy

rough

BRIGHT
WHITE

small
grains

Sweden

lime.

Calcareus Granulatus
Alb. 2.
Cronstedt.

13. BRIGHT GRITTY LIMESTONE.

Irregular
strata

brittle

light

dufty

SHINING
WHITE

fulphure-
ous smell

Italy

for brimstone.

Calcareus
Scintillans
Cronstedt.

14. RED GRITTY LIMESTONE.

Thick strata

hard

heavy

rugged

REDDISH

crackly

England

lime.

Calcareus Granulatus
Ruber
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
15. GREEN GRITTY LIMESTONE.							Calcareus Granulatus Virescens. W.
Thin strata	tender	light	irregular	DARK GREEN	burns easily	Germany	lime.
16. BLACK AND WHITE GRITTY LIMESTONE.							Calcareus Granulatus Nigro Albescens Cronstedt.
Thick beds	hard	heavy	undulated	MARBLED, OF BLACK, WHITE, AND BROWN	burns slowly	Salberg	lime.
17. GREEN AND WHITE GRITTY LIMESTONE.							Calcareus Granulatus Albo Viridis Cronstedt.
Rude lumps	tender	heavy	rugged	WHITE, AND GREEN	blotch'd	Salberg	lime.
18. WHITE FLAKY LIMESTONE.	3.	FLAKY	Y L	I M E S T O N E S.			Calcareus Squammosus Albus Cronstedt.
Vast masses	hard	light	rugged	SNOW WHITE	thick plates	Sweden	lime.

19. GREY FLAKY LIMESTONE.	Thin strata	tender	heavy	smooth	DUSKY GREY	coarse scales	Germany	lime.	Calcareus Squamosus Griseus Cronstedt.
20. SILVERY FLAKY LIMESTONE.	Small lumps	very hard	heavy	polished	PURE WHITE	close, small scales	Sweden	lime.	Calcareus Albus Dalarnensis Cronstedt.
21. RED FLAKY LIMESTONE.	Great strata	tender	very heavy	uneven	RUDDY	large scales	Germany	lime.	Calcareus Ruber Cronstedt.
22. CLOUDED FLAKY LIMESTONE.	Thick strata	hard	heavy	rugged	GREY, RED, AND WHITE	small scales	Sweden	lime.	Calcareus Variegatus Cronstedt.

If there can be a distinction between Limestone, and Marble, this twenty-second kind is the connecting link: 'tis either the coarsest of the Marbles, or the finest of the Limestones.

COMPOUND FOSSILS.

2. MARBLE S.

Sparry Stones, bright, and glittering.

I. OF ONE COLOUR.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. PARIAN MARBLE.							
Vast blocks	tender	heavy	wrinkled	PURE WHITE	glittering	Paros	for statues. Marmor Nobile Album. L.
2. CARRARA MARBLE.							
Great masses	hard	heavy	smooth	GOOD WHITE	clear	Italy	statues. Marmor Lunenfe. H.

3. GREY MARBLE.	Thick strata	very hard	heavy	irregular	DUSKY GREY	smells like horn, when burnt	Hildesheim	Marmor Palumbinum. W.	ornaments.
4. YELLOW MARBLE.	Vast strata	very hard	heavy	rugged	PALE YELLOW	sparkling	Italy	Marmor Terebinthinatum Cæſalp.	ornaments.
5. RED MARBLE.	Great blocks	hard	heavy	irregular	DULL RED	opaque	Italy	Marmor Rufum. L.	ornament.
6. BLUE MARBLE.	Thick beds	very hard	very heavy	wrinkled	DUSKY BLUE	high polish	Spain	Marmor Numidium. H.	monuments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. GREEN MARBLE.							
Broken strata	tender	light	smooth	GREEN	cloudy	England	Marmor Lacedemonium. H. ornaments.
8. SPARKLING BLACK MARBLE.							
Vast strata	very hard	heavy	granulated	BRIGHT BLACK	glittering	Italy	Marmor Luculleum. H. for tombs.
9. DULL BLACK MARBLE.							
Great blocks	tender	very heavy	smooth	DEAD BLACK	a touch- stone	Italy	Marmor Chium. H. monuments.
10. BROWN MARBLE.							
Thick strata	soft	light	irregular	UMBER- COLOUR	dull	Italy	Marmor Lividum. W. ornaments.

2. SHELLY MARBLE S.

II. GREY SHELLY MARBLE.							Marmor Venosum Album Agric.
Vast strata	tender	heavy	wrinkled	WHITE	grey veins, and small shells	Italy	chimney-pieces.
12. GREY ENTROCHINE MARBLE.							Marmor Derbienne. H.
Immense blocks	hard	heavy	most irregular	GREY	fossil, en- trochi, and shells	Derbyshire	chimnies.
13. GREEN SHELLY MARBLE.							Marmor Virescens. H.
Great beds	tender	very heavy	uneven	DULL GREEN	shells with white spar	Bohemia	ornaments.
14. GREY GREEN SHELLY MARBLE.							Marmor Cinereo-virens. H.
Deep strata	tender	light	rugged	GREYISH GREEN	black and white shells	Suffex	ornaments.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. BLACK SHELLY MARBLE.							
Great blocks	hard	heavy	rumpled	DEEP BLACK	white shells	Ireland	Marmor Nigerrimum. H. tombs.
16. BLACK CORALLOIDE MARBLE.							
Thick strata	hard	very heavy	uneven	GREYISH BLACK	feathery coralloides	Derbyshire	Marmor Coralliticum. H. ornaments.
3. V A R I E G A T E D M A R B L E S.							
17. WHITE AND GREY MARBLE.							
Vast strata	tender	heavy	irregular	GOOD WHITE	blueish grey veins	Italy	Marmor Albocaruleum. H. ornaments.
18. PURPLE AND WHITE MARBLE.							
Deep strata	hard	very heavy	cracked	WHITE, AND PURPLE	blotch'd	Italy	Marmor Albopurpureum. H. ornaments.

19. BROWN AND WHITE MARBLE.

Thick strata soft light

BROWN,
AND
WHITE

blotches.
scratch'd
by a pin

Italy

ornaments.

Marmor
Albofuscum.
H.

20. RED AND WHITE MARBLE.

Vast strata very hard very heavy

PALE RED,
AND WHITE

veined

Italy

chimney-pieces.

Marmor
Alborubescens
H.

21. BLUE AND WHITE MARBLE.

Great strata soft light

BLUEISH,
AND WHITE

in
blotches

Italy

ornaments.

Marmor
Alboæruleum.
H.

22. BROWN RED AND WHITE MARBLE.

Great blocks hard heavy

THREE-
COLOUR'D

veins and
blotches

Italy

ornament.

Marmor
Pallidescum. V.
H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
23. BROWN BLACK AND WHITE MARBLE.							
Great strata	tender	heavy	crack'd	THREE-COLOUR'D	veins and blotches	Italy	Marmor Fuscum Nigrovariegatum. H. ornaments.
24. BROWN AND WHITE MARBLE.							
Great blocks	very hard	very heavy	smooth	BROWN	white blotches	Italy	Marmor Fusco- albidum. H. ornaments.
25. SYENNA MARBLE.							
Vast blocks	tender	heavy	shattery	YELLOW, WITH	purple spots and blotches	Italy	Marmor Flavopurpureum. H. ornaments.
26. AFRICAN MARBLE.							
Great strata	hard	very heavy	irregular	YELLOW, WITH	deep blue spots	Africa, and Spain	Marmor Flavocæruleum. H. chimney-pieces.

27. BROCCATELLO MARBLE.	Thin strata	tender	very heavy	undulated	DEEP YELLOW, WITH	red and white veins	Spain	ornaments.	Marmor Portafancta. W.
28. BLACK AND WHITE MARBLE.	Vast strata	very hard	heavy	rugged	BLACK, WITH	narrow white veins	Italy	tombs.	Marmor Nigro- album. H.
29. BLACK AND GOLD MARBLE.	Thick strata	hard	very heavy	irregular	FINE BLACK	yellow veins	Italy	ornaments.	Marmor Nigro- luteum. H.
30. BLACK AND RED MARBLE.	Great blocks	hard	heavy	smooth	GOOD BLACK	red and white veins	Ireland	chimney-pieces.	Marmor Nigro- rubens. H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
31. BLACK BROCADE MARBLE.							Marmor Nigrum Variegatum. H.
Thick strata	tender	heavy	rugged	FINE BLACK	red, white, and yellow veins	Derbyshire	ornaments.
32. AUGUSTAN MARBLE.							Marmor Viride Album. H.
Thick masses	firm	very heavy	rugged	LIGHT GREEN	white veins and talc	Ægypt	ornaments.
33. BLACK SERPENTINE MARBLE.							Marmor Ophites Niger. H.
Great lumps	hard	heavy	irregular	DEEP GREEN	black and white spots	Africa	ornaments.
34. WHITE SERPENTINE MARBLE.							Marmor Ophites Album. H.
Great lumps	soft	light	rugged	LIGHT GREEN	white, and some black spots	Ægypt	ornaments.

35. GREY AND BLACK MARBLE.

Large masses very hard heavy

ASHY
GREY

black
spots

Africa

ornaments.

Marmor Ophites
Cinereus.
H.

36. ARABIAN MARBLE.

Great lumps hard heavy

BROWNISH
GREY

oblong,
green
spots

Arabia

ornaments.

Marmor Fusco-
virens.
H.

37. GREEN VEIN'D MARBLE.

Large masses hard very heavy

LIGHT
GREY

green
veins, and
spots

Germany,
Cornwall

ornaments.

Marmor Cinereo-
virens.
H.

38. RED AND GOLD MARBLE.

Great strata hard heavy

GOOD
RED

gold and
white
veins

Italy

ornaments.

Marmor
Thebaicum.
H.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
39. ONYX MARBLE. Small masses	hard	light	in broken beds	BROWN	blue, black, white, in beds	Germany	Marmor Polyzonias. W. snuff-boxes.
40. FLORENTINE MARBLE. Great masses	tender	heavy	rugged	YELLOWISH BROWN	rude figures in black	Italy, Arabia	Marmor Florentinum. L. ornaments.
41. DENDRITE MARBLE. Great lumps	hard	heavy	rough	PALE BROWN	mocoa figures in black	Hesse	Marmor Haffiacum. W. ornaments.
42. SLATE MARBLE. Thick strata	tender	heavy	plated	WHITISH YELLOW	fissile	Germany	Marmor Fissile. L. ornaments.

43. LIMESTONE MARBLE.	Thick strata	soft	heavy	plated	BLACK	shattery	Sweden	for lime.	Marmor Schistofum. L.
44. CRYSTALLINE MARBLE.	Great lumps	very hard	heavy	granulated	PURE WHITE	almost transpa- rent	Sweden	ornaments.	Marmor Tardum. L.
45. CHAFFY MARBLE.	Great lumps	tender	heavy	streaky	SNOW WHITE	bright and chaf- fy, when broke	Lapland	ornaments.	Marmor Acrosum. L.
46. CLAY MARBLE.	Vast strata	soft	heavy	crack'd	RUDDY	full of shells and ætitæ	Sweden	ornaments.	Marmor Stratarium. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
47. SANDY MARBLE.							
Great strata	soft	heavy	irregular	BROWNISH WHITE	full of sand and clay	France	building. Marmor Sectile L.

S T O N E S.

ORDER IV.

C O N C R E T E S.

Composed of various matters, rudely mixt together.

I. P O R P H Y R Y S.

Composed of Jasper, Crystal, and Shirl.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PURPLE AND WHITE PORPHYRY.							
Vast rocks	very hard	very heavy	rugged	DEEP PURPLE	small white specks	Ægypt	Saxum Porphyrius γ. L. ornaments.
2. BROWN RED AND WHITE PORPHYRY.							
Great rocks	very hard	heavy	granulated	DEEP BROWN	purple and white spots	Sweden	Saxum Porphyrius. L. ornaments.
3. BLACK AND RED PORPHYRY.							
Thick strata	very hard	heavy	irregular	BLACKISH	spots of deep red	Arabia	Saxum Porphyrius α. L. ornaments.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
4. BLACK RED AND WHITE PORPHYRY.							
Vaft blocks	very hard	heavy	ragged	DEEP BLACK	spots of red and white	Ægypt	ornament. Saxum Porphyrius β. L.
5. GREY AND BLACK PORPHYRY.							
Great mafles	very hard	heavy	uneven	RAVEN GREY	spots of deep black	Syria	ornaments. Saxum Porphyrius α. L.
6. GREEN AND WHITE PORPHYRY.							
Vaft rocks	very hard	heavy	rugged	PALE GREEN	white spots	Germany	ornaments. Saxum Porphyrius δ. L.
7. MINORCAN PORPHYRY.							
Great mafles	moft hard	very heavy	granulated	BRIGHT RED	green, white, and black spots	ifland of Minorca	worthy the first ufes. Porphyrius Miniaceus. H.

8. ROSE PORPHYRY.

Vast blocks very hard heavy

9. GREY AND WHITE PORPHYRY.

Rounded lumps hard heavy

2.

Composed of Jasper, Crystal, and Talc.

1. RED AND BLACK GRANITE.

Immense rocks very hard heavy

2. BLACK RED AND WHITE GRANITE.

Vast rocks most hard heavy

Porphyrius
Carneus.
H.

for ornaments.

Porphyrius
Griseus
Cronstedt.

for ornaments.

Granita
Rubra.
H.

ornaments.

Granites
Pyropæciles.
H.

obelisks.

black,
green,
white
spots

ROSE
COLOUR

most
rugged

white
spots

DARK
GREY

very
smooth

E S.

I T

A N

G

2.

black
spots

FINE RED

rugged

heavy

white
spots

MIXT

BLACK AND
RED

irregular

heavy

Ægypt

Arabia

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. GREEN RED AND WHITE GRANITE.							Saxum Granites Chinense. L.
Great masses	hard	heavy	rugged	GREEN AND RED	white spots	China	ornaments.
4. MOORSTONE GRANITE.							Granita Albo- nigra. H.
Great lumps	very hard	heavy	most rugged	WHITE	black spots	Cornwall	curbs and steps in building.
5. GOLDEN GRANITE.							Granites Luteoniger. H.
Great lumps	hard	heavy	rugged	FLESH COLOUR'D	white, black, and gold spots	Minorca	fit for the best uses.
6. LOOSE GRANITE.							Granites Friabilis Cronstedt.
Crumbly masses	harsh	heavy	irregular	RUDDY	white and black spots	Sweden	for melting furnaces.

3. T R A P E S T O N E S.

Composed of Jasper, Clay, and Slate; with some Iron.

1. GREY CHAFFY TRAPESTONE.		flaty	RAVEN GREY	spotted whitish	Sweden	Trapiskiol Grisea Cronstedt. glass bottles.
Flat cakes	hard					
2. BLACKISH CHAFFY TRAPESTONE.		bed upon bed	BLACK	blackier spots	Delarne	Trapiskiol Nigra Cronstedt.
Vast rocks	hard					
3. ASHY SAND TRAPESTONE.		granulated	ASH COLOUR'D	dark spots	Sweden	Trapiskiol Cinerea Cronstedt. bottles.
Thick strata	brittle					
4. BROWN TRAPESTONE.		gritty	DEEP BROWN	whitish specks	Sweden	Trapiskiol Fusca Cronstedt. bottles.
Whole rocks	hard					

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USERS.
5. RUDDY TRAPESTONE.							
Serpentine veins	very hard	very heavy	coarse, and rough	RUDDY	brown spots	Norway	Trapiskiol Rufa Cronstedt. coarse glass.
6. WHITISH TRAPESTONE.							
Vast strata	tender	heavy	smooth	WHITISH	white specks	faintly striated	Trapiskiol Sorberkenhus Cronstedt glass.
7. BLUE TRAPESTONE.							
Rocks	hard	very heavy	even	DEAD BLUEISH	unspotted	uniform	Trapiskiol Cæruleus Cronstedt. good glass.
8. BLACK FINE TRAPESTONE.							
Veins in rocks	hard	heavy	smooth	DEEP BLACK	unspotted	close	Trapiskiol Nigra Cronstedt. touchstone.

The Trapestones have all a tendency to split like Slate; and to break into a kind of large dice, when shattered by a perpendicular blow: they do not always form whole rocks; but make thick veins in their uneven cracks. They are usually found with various mixtures, and all contain some iron.

S T O N E S.

O R D E R V.

Q U A R R Y S T O N E S.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. LAPLAND QUARRY STONE.							
Rocks	hard	heavy	raised in small lumps	REDDISH	white spots.	Lapland	Saxum Laponicum, L. *
28. DANNEMORE QUARRY STONE.							
Thick strata	very hard	heavy	irregular	BLUEISH	transparent, in thin pieces	Dannemore	Saxum Dannemorensis, L. a poor iron ore.

* In regard to these Stones, no author is so excellent as Linnaeus: himself has examined them in Sweden; and all his distinctions may be depended on: 'Twere well if the Stones of other countries had been so observ'd; but these run thro' all the north.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. SAHLBERG QUARRY STONE.							
Rocks	tender	heavy	uneven	GREY	coarse granulated	Sahlberg	lime. Saxum Sahlbergenf. L.
4. ITALIAN QUARRY STONE.							
Thick strata	soft	heavy	plated	PALE BROWN	scaly, with talc	Italy	in buildings. Saxum Talcolum. L.
5. CAPE QUARRY STONE.							
Great masses	tender	light	granulated	GREY	small black spots	island of St. Helena	lime. Saxum Helenæ. L.
6. MOUNTAIN QUARRY STONE.							
Thick strata	very hard	heavy	wav'd	PALE BLUEISH GREY	small white spots	tops of Lap- land moun- tains	glafs. Saxum Æthereum. L.

7. WAVY QUARRY STONE.

Rocks

hard

heavy

undulated

RUDDY
BROWN

spangled
with talc

Sweden

building.

Saxum
Undulatum.
L.

8. RADIANT QUARRY STONE.

A vast rock

hard

heavy

rugged

PALE
BROWN

rays of
black and
purple
garnets

Germany

building.

Saxum
Radians.

9. FAHLUN QUARRY STONE.

Vast strata

tender

heavy

granulated

RUDDY
BROWN

white
specks

Fahlun

building.

Saxum
Fahlunense.
L.

10. PEARLY QUARRY STONE.

Thick strata

hard

heavy

coarsely
granulated

WHITISH

white
specks

Nericia

building.

Saxum
Margaritaceum.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
11. WHETTING QUARRY STONE.							
Thin strata	tender	heavy	flreaky	REDDISH WHITE	friated	Scania	whetstones. Saxum Novaculare, L.
12. STENSHUWHEED QUARRY STONE.							
Thick strata	soft	light	scaly	YELLOWISH BROWN	flaky	Sweden	whetstones. Saxum Stenonis, L.
13. MORANE QUARRY STONE.							
Thick strata	hard	light	rugged	REDDISH BROWN	transpa- rentspecks	Sweden	building. Saxum Morense, L.
14. BLACK LIN'D QUARRY STONE.							
Great rocks	very hard	heavy	uneven	RUST COLOUR'D	black streaks	Sweden	buildings. Saxum Decussatum, L.

17. CORN STONE.

Thick strata

tender

way'd

PALE
BROWN

oblong
specks

Germany

Saxum
Frumentale.
L.

buildings.

16. MIXT QUARRY STONE.

Vast strata

hard

heavy

rugged

WHITISH

black, fil-
very, and
red spots

Sweden

Saxum
Molare.
L.

for mill stones.

17. GARPENBERG STONE.

Great strata

hard

heavy

granulated

WHITISH

with small
white talc

Garpenberg

Saxum
Garborge.
L.

buildings.

18. BLUE GREEN QUARRY STONE.

Thick strata

tender

light

flaky

BLUEISH
GREEN

greenest
wet

Smoland

Saxum
Ceruleum.
L.

furnaces.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
19. SALT QUARRY STONE.							
Great rocks	tender	heavy	flaky	BROWN	spangled, crumbles in air	Sweden	^{Saxum Fatiscens. L.} for nitre.
20. ALPINE QUARRY STONE.							
Thick strata	shattery	heavy	irregular	PALE BROWN	with talc and granites	Norway	^{Saxum Alpinum. L.} buildings.
21. GRANITE QUARRY STONE.							
Vast rocks	hard	heavy	rugged	BLACK	with brown granites and talc	Sweden	^{Saxum Granatum. L.} buildings.
22. ROSE QUARRY STONE.							
Thick strata	very hard	heavy	raised in lumps	PALE RED	white and talcy spots	Sweden	^{Saxum Tritorium. L.} mill stones.

Saxum
Roerosienfe.
L.

building.

Norway

fifile

BLACK AND
WHITE

plated

23. NORWAY QUARRY STONE.

Vaſt rocks

hard

heavy

Saxum
Montanum.
L.

buildings.

Sweden

ſpangles
of yellow
talcPALE
BROWN

irregular

light

Whole
mountains

tender

Saxum
Mareſtrandenſe.
L.

buildings.

Sweden

ſmall
white
ſpangles

WHITISH

uneven,
and
plated

light

Vaſt ſtrata

tender

Saxum
Punſtatum.
L.

buildings.

Sweden

red gar-
nets and
white
ſpangles

REDDISH

plated

heavy

Thick beds

hard

26. RUDDY QUARRY STONE.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
27. BITSBERG QUARRY STONE.							
Great rocks	hard	heavy	streaky	BLACK	longish black specks	Sweden	Saxum Bitsbergenſe. L. buildings.
28. METALLINE QUARRY STONE.							
Thick strata	very hard	heavy	smooth	ASH COLOUR'D	white specks and spangles	Sweden	Saxum Metalliferum. L. mother of ores.
29. SIBERIAN QUARRY STONE.							
Great masses	very hard	heavy	smooth	RED	white spots	Siberia	Saxum Sibericum. buildings.
30. ANGERMAN QUARRY STONE.							
Thin strata	hard	heavy	rudded	WHITISH	full of black talc	Sweden	Saxum Angermanenſe. L. buildings.

31. NORBERG QUARRY STONE.

Vast beds hard very heavy

Norberg mother of iron ore.

Saxum
Norbergense.
L.

white
spots

WHITE

irregular

32. FURNACE QUARRY STONE.

Great strata flaty heavy

Sweden for furnaces.

Saxum
Fornaceum.
L.

white and
talcly spots

GREY

plated

33. WHETTING STONE.

Oblong
masses tender heavy

Cologn for whetstones.

Saxum
Cotrarium.
L.

like fossil
wood

DEEP
BROWN

flaky

34. ANTIENT QUARRY STONE.

Vast rocks hard heavy

Sweden furnaces.

Saxum
Grandævum.
L.

talcly and
bright
spots

DARK
GREY

granulated

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
35. BINGING QUARRY STONE.							
Great rocks	very hard	heavy	smooth	IRON GREY, WITH SMALL GARNETS	rings, when struck	Sweden	Saxum Tinnitans. L. buildings.
36. CLAY QUARRY STONE.							
Thick strata	hard	heavy	smooth	YELLOWISH BROWN	like hard clay	Sweden, England	Saxum Primigenum. L. coarse buildings.
37. PALE QUARRY STONE.							
Great strata	tender	light	rough	WHITISH BROWN	coarse	Northamp- tonshire	Pfadturium Fragile. H. buildings.
38. BRIGHT QUARRY STONE.							
Thick strata	hard	heavy	uneven	WHITISH	fine	Dorsetshire	Pfadturium Durius. H. buildings.

39. DUSKY QUARRY STONE.				Psalurium Albidofuscum. H.	
Vast strata	tender	light	irregular	DUSKY GREYISH	coarse Portland buildings.
40. ROUND GRITTED QUARRY STONE.				Psalurium Rotundatum. H.	
Great masses	tender	light	granulated	PALE BROWN	formed of crumbly stalag- mites Ketton, in Rutland buildings.
41. TAWNY QUARRY STONE.				Psalurium Scintillans. L.	
Thick strata	soft	light	rugged	YELLOWISH BROWN	full of spangles Leicester- shire in buildings.
42. OLIVE QUARRY STONE.				Ammoschistum Virefcens. H.	
Vast strata	tender	heavy	plated	GREYISH GREEN	fiffile, and spangled Mendip hills in buildings.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
43. SPUNGY QUARRY STONE.							
Great rocks	very hard	heavy	uneven	PALE GREY	porous	Yorkshire	Sympexium Porosum. H. in buildings.
44. STRAW COLOUR'D QUARRY STONE.							
Thick strata	hard	very heavy	irregular	VERY PALE YELLOW	deeper yellow veins	Dorsetshire	Sympexium Albido- flavescens. H. in buildings.
45. LEAD COLOUR'D QUARRY STONE.							
Thick strata	very hard	heavy	smooth	DULL BLUEISH	perfectly even, like flint	Northamp- tonshire	Sympexium Subcaruleum. H. in buildings.

46. VARIEGATED QUARRY STONES.

Thin strata	tender	heavy	irregular	DUSKY RED	blotches of green	Derbyshire	coarse buildings.
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* Sympexium Rubro-
virens,
H.

* These are the Stones of England, differing from the Swedish : five and twenty-years since, I examined, one by one, the Quarry Stones of this kingdom, in the same manner in which the excellent Linnaeus has lately gone through those of Sweden. I hope those who study Fossils in other countries, will follow the same method ; for there is no other : and the subject is worthy all attention.

S T O N E S.

ORDER VI.

A G G R E G A T E S.

Formed of various Fossil matters, connecting, coating, or concreted with one another.

1. C O N N E C T I N G P U D D I N G S T O N E S.

A pebbly matter cementing together various pebbles.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PALE PUDDING STONE.							
Great lumps	very hard	heavy	full of lumps	CREAM COLOUR'D	various pebbles	Hertfordshire	Lithozugium Albo-Flavicans. H. for snuff-boxes.
2. GREY PUDDING STONE.							
Large masses	hard	heavy	rude	BRIGHT GREY	large pebbles	Hertfordshire	Lithozugium Albogriseum. H. snuff-boxes.
3. RED PUDDING STONE.							
Large lumps	hard	heavy	rugged	RED	small pebbles	Lincolnshire	Lithozugium Rubescens. H. ornaments.
4. BROWN PUDDING STONE.							
Great lumps	soft	heavy	irregular	DULL BROWN	filled with various pebbles	Leicestershire	Lithozugium Fuscum. H. boxes.

5. COARSE RED PUDDING STONE.

Vast lumps

soft

heavy

rude

DULL RED

red,
crystalline
lumps

Yorkshire

coarse buildings.

Lithozugium Impurius
Rubescens.
H.

6. COARSE BLUE PUDDING STONE.

Vast masses

hard

heavy

rugged

BLUEISH

with
white
lumps

Leicester-
shire

pavements.

Lithozugium Impurius
Ceruleus.
H.

7. COARSE GREENISH PUDDING STONE.

Rounded
nodules

very hard

heavy

rugged

GREEN

with co-
lourless
lumps

Minorca,
England

fit for fine works.

Lithozugium Albo-
virens.
H.

8. COARSE VEINY PUDDING STONE.

Great lumps

soft

heavy

rugged

PALE RED

white
veins and
lumps

Scarborough

coarse buildings.

Lithozugium Impurius
Venosum.
H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
9. OCHREOUS PUDDING STONE.							
Great lumps	hard	very heavy	rude and irregular	YELLOWISH BROWN	full of pebbles and sand	Sweden	coarse furnaces.
10. SHELLY PUDDING STONE.							
Irregular masses	soft	heavy	rugged	TAWNY	full of shells, sand, and pebbles	Sweden	an iron ore.
11. SANDY PUDDING STONE.							
Thin beds	soft	heavy	uneven	YELLOW	full of large sand	Germany	an iron ore.

Saxum
Amnigenum.

L.

Tophus
Marinus.

L.

Tophus
Arenaceus.

L.

AGGREGATE STONES.

ORDER II. CONCRETED. TOPHES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. BROWN CLAY TOPHE.							
Great lumps	hard	heavy	smooth	YELLOWISH BROWN	clay-like	Effex	Tophus Argellaceus Fuscus. H. useless.
2. REDDISH CLAY TOPHE.							
Large masses	very hard	heavy	wav'd	REDDISH	stone-like	Sweden	Tophus Argilleaceus. L. useless.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. SANDY TOPHE.							
Thin cakes	brittle	heavy	uneven	YELLOWISH	sandy	German Spa	Tophus Thermalis. L. useless.
4. WHITE STONE TOPHE.							
Great lumps	hard	heavy	smooth	WHITISH	clay-like surface	Sweden	Tophstein Alba Cronstedt.
5. GREY STONE TOPHE.							
Great lumps	tender	heavy	smooth	GREY	hard on the surface	Sweden	Tophus Ludus. L.
6. GLOBE TOPHE.							
Round lumps	hard	heavy	dufty	YELLOW	sandy	clay pits	Tophus Globus. L.

Tophus
Sulphureus.
L.

Tophus
Aluminaris.
L.

Tophus
Osteoscolla,
L.

7. SULPHUR TOPHE.

Thick cakes

tender

light

dufty

GREY

burns like
brimstone

mineral
waters

8. ALUM TOPHE.

Thick lumps

soft

heavy

irregular

GREYISH
BROWN

compact

alum works

9. BONE TOPHE.

Hollow
pieces

tender

light

uneven

WHITE

bone-like

Germany

a medicine.

A G R E G A T E S.

ORDER III.
COATING.

CRUSTATED BODIES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ROOT CRUST.							
Oblong pieces	tender	light	rugged	RUSTY BROWN	hollow	Ireland	Tophus Pertusus. L.
2. WOOD CRUST.							
Oblong pieces	soft	heavy	rough	YELLOWISH	coated as wood	Germany	Tophus Sideroxylon. L.

Empheropyra
Lavis.
H.

Empheropyra
Mollior.
H.

H.
Heteropyra
Dunior.
H.

H.
Empheropyra
Geodes
Rimosa.
H.

U S E 3.

3. HARD NUCLEATE CRUST.	light	lumpy	BROWNISH	prismatic	Germany
Oval lumps	heavy	rugged	YELLOWISH	ruddy crusts	England
4. SOFT NUCLEATE CRUST.	light	scaly	BROWNISH	ruddy and greenish crusts	England
Round lumps	heavy	duffy	YELLOWISH	rattleslike eagle- stone	England
5. SOUNDING NUCLEATE CRUST.	heavy	full of cracks	YELLOWISH	ruddy crusts, duffy within	England
Round lumps	hard				
6. HARD DUSTY CRUST.	heavy				
Flatted lumps	hard				

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. SOFT DUSTY CRUST.							
Oval lumps	soft	heavy	rugged	TAWNY	purple, yellow crusts.	England	Geodes Rugosa. H.
8. GREAT WATER CRUST.							
Large lumps	hard	heavy	crack'd	YELLOWISH	brown crusts, water within	England	Enhydros Crassior. H.
9. SMALL WATER CRUST.							
Oval	tender	light	dufty	BROWNISH	ruddy crusts, and water	England	Enhydros Tenuior. H.
10. PEA CRUST.							
Rude lumps	soft	light	of round lumps	BROWNISH	brittle	Germany	Tophus Oolithus. L.

11. CONIC CRUST.	Thick cones	tender	light	rugged	YELLOWISH BROWN	ruddy blotches	Helfenbeng	Tophus Turbinatus. L.
12. ONION CRUST.	Round balls	tender	heavy	shelly	BLACK	ragged at edges	Asia	Tophus Spatofus. L.
	○ ○							
13. PEAR CRUST.	Oblong lumps	soft	heavy	tilly	REDDISH YELLOW	brown crufts	Westrogoth- land	Tophus Cotaceus. L.
14. TURN'D CRUST.	Oval lumps	very hard	very heavy	scaly	DEEP BLACK	a ball of pyrites in the centre	Yorkshire	Tophus Lenticularis. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. RAGGED CRUST.							
Vast lumps	tender	heavy	ragged	YELLOWISH	flaty	Germany	Tophus Schistolus. L.

A G G R E G A T E S.

O R D E R IV.

H E L M O N T I Æ.

W A X E N V E I N S.

Concreted Clay, and Spar, with cracks filled up by various matters.

I. WITH THE VEINS OF SPARK.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. WHITE WAXEN VEIN.							
Flatted cakes	hard	heavy	crack'd in small divisions	WHITE ON SURFACE, BROWN WITHIN	lemon- colour'd veins	river fides in Germany	Secomia Cinerea. H. a medicine for the gravel.
2. BLACKISH WAXEN VEIN.							
Oval cakes	tender	heavy	large divisions	BLACKISH BROWN	white veins	Pancrafs	Secomia Fusco- nigricans. H.
3. CLAY COLOUR'D WAXEN VEIN.							
Vaft cakes	hard	heavy	large divisions	BROWNISH YELLOW	pale yel- low veins	London, clay-pits	Secomia Fusco- flavescens. H.
4. BROWN WAXEN VEIN.							
Vaft cakes	very hard	heavy	few divisions	RUSTY BROWN	brown veins	Hertford- fhire	Secomia Fusco- ferruginea. H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. CRUSTED WAXEN VEIN.							
Flatted masses	hard	heavy	rugged	YELLOWISH	crusted over, a nucleus	Deptford	Secomia Cruſtata. H.
6. IRON WAXEN VEIN.							
Flat masses	hard	heavy	few cracks	REDDISH BROWN	yellow veins	Yorkshire	Secomia Ferruginea, H.
2. WITH EARTHY VEINS.							
7. COMPACT WAXEN VEIN.							
Vaſt rounded cakes	very hard	heavy	numerous cracks	UMBER BROWN	white earthy veins	Leiceſter- ſhire	Gaiophragmium Fufcum. H.
8. COATED WAXEN VEIN.							
Oval lumps	hard	heavy	a thin coat	PALE BROWN	reddiſh brown veins	Yorkſhire	Gaiophragmium Ferrugineum. H.

3. WITH THE VEINS OF MUNDIC.

Pyriticum
Mollus.
H.

9. SOFT WAXEN VEIN.

Oval lumps	tender	light	porous	GREYISH BROWN	veins of mundic	Sheppey Island
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4. WITH CRYSTALLINE VEINS.

Diagophragmium
Ferrugineum.
H.

10. CRYSTALLINE WAXEN VEIN.

Flat cakes	very hard	heavy	smooth	RUSTY BROWN	bright crystalline veins	Yorkshire
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11. BLUE WAXEN VEIN.

Diagophragmium
Ceruleum.
H.

Oval cakes	tender	heavy	rough	BLUEISH	yellowish crystalline veins	Yorkshire
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5. CRUSTED WITH A NUCLEUS.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
12. LEMON WAXEN		VEIN.					
Round lumps	hard	heavy	smooth	YELLOWISH BROWN	black nucleus, pale veins	Mendip	Brachypyrenium Flavescens. H.
13. SMALL WAXEN		VEIN.					
Oval balls	tender	light	rudd	BROWN	yellow veins, and earth within	Northamptonshire	Bezoarticum Minerale. H.
14. HOLLOW WAXEN		VEIN.					
Turbinated balls	very hard	heavy	clay-like	GREYISH BROWN, YELLOW VEINS	a dusky hollow nucleus	Knightbridge	Brachypyrenium Fuscum. H.

N A T I V E F O S S I L S.

C L A S S IX.

S A L T S.

Soluble in water; and acrid to the taste.

O R D E R I.

A C I D S A L T S.

Sour to the taste, and corrosive; dissolving many bodies.

G E N U S I.

N I T R E.

A Prism of fix fides, terminated at each end by a Pyramid of fix fides: * bitter, cold, and acrid to the taste.

* This is the form of pure Nitre, perfectly crystalized; but this, and all other Salts, are often foul, and shapeless.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PURE NITRE.							
Small crystals	tender	heavy	glossy	CLEAR	moist	Finland, in Rapikivi stone	Nitrum Nudum, L.
2. STONY NITRE ORE.							
Vast rocks	hard	heavy	plated	GREY	friable	Finland	Saxum Nitrosum, W. for nitre.
3. BROWN NITRE ORE.							
Vast beds	brittle	light	duffy	DEEP BROWN	crumbly	Persia	Terra Nitrofa Humacea, W. for nitre.
4. WHITE NITRE ORE.							
Thick strata	hard	heavy	crack'd	WHITISH	firm	India	Terra Nitrofa Calcareo, W. for nitre.
5. PLUMOSE NITRE.							
Small tufts	tender	light	thready	WHITE	crumbly	on rocks and walls	Nitrum Efflorescens, H. for nitre.

TH E S E are all the appearances in which Nitre is seen. The first is very rare; the Crystals lie in little fissures of the Stone: the second, third, and fourth are the proper ores of this Salt: and in the fifth it shews itself from such ores, or others, in irregular crystalizations.

Nitre in all these forms is one thing; disguised by various mixtures, as we see the earthy Fossils also often are; but from any of them it may be obtained pure by crystalization.

Till lately, this quality of crystalization was supposed peculiar to Salts; till very lately indeed: for 'tis but within these three weeks I have found Spar may be dissolved and crystalized again in the manner of Salts. In the preceeding part of this work, * I have lamented the ill success of four years trial: and formed my better hopes upon an assisting hand: that gentleman is absent from the kingdom; but my own farther trials have succeeded. The excellent Linnæus will be pleased with this; tho' it be contrary to his opinion; he only wanted to see *Terram, via humida, crystalisari posse abs sale*, to be less firm in the idea of all crystalization being owing to Salt. This

* Page 66.

ocular testimony is now given : and I must continue to remove the stony bodies out of the Saline System.

I am aware it will be objected by such as see but half way into philosophical enquiries ; that myself have proved Spar to have a Saline part ; by shewing it composed of the Mineral Acid, and Bitumen : but we must use precision in our words, as well as ideas, on these subjects. The Mineral Acid is not in itself a Salt : 'tis true, it forms them all by various mixtures. By another mixture, it forms Spar ; a Stone, with the form of a Salt : but that form is its own : it neither is the form of any Salt, nor is caused by any Salt : and that is what remained to be proved : the question solely was, Do Spars owe their angulated forms, to any Salt ? and that is answered, No.

ACIDS SALT S.

GENUS II.

ALUM.

A dye of eight fides, with trigonal planes.

Austere and astringent to the taste; bubbling in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
1. P U R E A L U M.							
Minute crystals	hard	heavy	polished	C O L O U R - L E S S	pellucid.	England, in cracks of fossil wood	Alumen Commune. L. in medicine, and the arts.
2. R O C K A L U M.							
Small crystals	hard	heavy	smooth	R E D D I S H	clear	Italy, in cracks of marble	Alumen Romanum. L. in medicine, and the arts.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
3. RUDE ALUM.							L'Alun Vierge Solide. W.
Large masses	tender	heavy	irregular	GREYISH	opaque	Italy	for refining into alum.
4. PLUMOSE ALUM.							Alumen Plumosum. W.
Small tufts	soft	light	feathery	OLIVE-COLOUR'D	striated	Archipelago	a medicine.
5. GRANULATED ALUM.							L'Alun Farineuse. W.
A dry powder	tender	light	uneven	WHITISH	small granules	Yorkshire	for alum.
6. BLACK ALUM ORE.							Terra Aluminaris Nigra. W.
Vast cakes	hard	heavy	rugged	DEAD BLACK	bituminous	Yorkshire	for alum.

7. BROWN ALUM ORE.

Great lumps

soft

light

uneven

UMBER-
COLOUR'D

bitumi-
nous

Saxony

for alum.

Terra Aluminaris
Fusca.
W.

8. WHITE ALUM ORE.

Small cakes

hard

light

rugged

PURE
WHITE

alkaline

Archipelago

for alum.

Terra Melia
Cæsalpin.

9. GREY ALUM SLATE.

Vast strata

hard

heavy

plated

DUSKY
GREY

slaty

Yorkshire

for alum.

Fissilis Aluminaris
Cinereus.
W.

10. BLACK ALUM SLATE.

Vast beds

hard

heavy

irregular

DEEP
BLACK

fissile

Yorkshire

for alum.

Fissilis Aluminaris
Nigra.
W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
11. RED ALUM SLATE.							
Great strata	tender	heavy	rugged	REDDISH	fiffile	Yorkshire	Fiffile Aluminaris Rubescens. W. for alum.
12. IRISH ALUM SLATE.							
Vaft cakes	soft	heavy	irregular	DEAD BLACK	rudely fiffile	Ireland	Lapis Hibernicus. H. a medicine for bruifes.
13. ALUM ROCK.							
Great maffes	very hard	heavy	uneven	REDDISH WHITE	fiffile	Italy	Calcareus Aluminaris. W. for alum.
14. COAL ALUM.							
Vaft beds	hard	heavy	plated	BLACK	bitumi- nous	Northum- berland	Lithanthrax Aluminaris. W.

15. WOOD ALUM.	Oblong pieces	hard	heavy	coated	BROWN	wood-like	Bohemia	Alumen Vegetabile. W.
	Great cakes	hard	heavy	crack'd	BLACK	breaks in wedges	Sweden	Schistus Aluminosus Cuneiformis. Cr.

To these might be added, the Pyritæ, for they contain Alum; but Sulphur being more predominant, 'tis best to refer them thither. 'Tis thus the mixtures of nature render a perfect method in Fossils, in itself impracticable. Metals, added to Alum, make what we call, Vitriols.

A C I D S A L T S.

G E N U S III.

V I T R I O L S.

A Rhomb more or less irregular.

Austere to the taste.

CRYSTALLIZED SIMPLE VITRIOLS.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
1. GREEN VITRIOL.							
Rude crystals	tender	heavy	uneven	PALE GREEN	fix-fided	foreft of Dean, in iron mines	Vitriolum Martis. L.
2. BLUE VITRIOL.							
Oblong crystals	hard	heavy	fmooth	FINE BLUE	twelve- fided	ifland of Cyprus	Vitriolum Cyprinum. L. a cauftic.
3. WHITE VITRIOL.							
Rude crystals	tender	heavy	uneven	DEAD WHITE	twelve- fided	Germany	Vitriolum Album. L. in medicine.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
8. BLUE STALACTICAL VITRIOL.							
Short cones	hard	heavy	rough	FINE BLUE	hollow	islands of Archipelago	Vitriolum Cupri Stalacticum. W. for blue vitriol.
9. BLUE EFFLORESCENT VITRIOL.							
Bubbly lumps	tender	light	botryoid	PALE BLUE	crumbly	Cyprus	Vitriolum Cupri Germinans. W. for blue vitriol.
MIXED VITRIOLS: SIMPLE AND FIRM.							
10. HERMAPHRODITE VITRIOL.							
Small crystals	hard	heavy	rough	BLUE GREEN	clustery	Hungary	Vitriolum Hermaphroditicum. L.
11. ICICLE VITRIOL.							
Perfect icicles	tender	light	coated	PALE BLUE GREEN	hollow	Bohemia	Vitriolum Cæruleovirens Stalacticum. W.

12. TRIPLE VITRIOL.

Small cubes hard heavy

DEEP
BLUE
GREEN

plated

Germany

Vitriolum
Triplum.
L.

13. STALACTITIC TRIPLE VITRIOL.

Tender
cones soft light

WHITISH
GREEN

hollow

Goffelaer

Vitriolum Cupreo-ferreo-
zincum Stalacticum,
W.

14. BYSSINE TRIPLE VITRIOL.

Tufts like
moss tender light

FAINT
GREEN

crumbly

Goffelaer

Vitriolum Cupreo-ferreo-
zincum Germinans,
W.

15. GREY GREEN VITRIOL.

Coarse
rhombs hard heavy

GREY
GREEN

plated

Goffelaer

Vitriolum Zinco-
ferreum
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
16. GLAUCOUS VITRIOL. Coarse crystals	tender	heavy	rugged	SEA GREEN	clustery	Saxony	Vitriolium Cinereum Cr.
S T O N Y V I T R I O L O R E S.							
17. RED VITRIOL ORE. Large masses	hard	heavy	irregular	BRICK COLOUR'D	cavernous	Archipelago	Vitriolium Chacitis. H.
18. GREY VITRIOL ORE. Rude lumps	brittle	light	uneven	PALE GREY	shattery	Archipelago	Vitriolium Sory. H.
19. YELLOW VITRIOL ORE. Large masses	hard	light	rugged	YELLOWISH	brittle	Archipelago	Vitriolium Misy. H.

20. BLACK VITRIOL ORE.

Great lumps

hard

heavy

rugged

DEAD
BLACK

cavernous

Greece

Vitriolum
Melantheria.
H.

EARTH VITRIOLIC ORES.

21. CRUSTED VITRIOL ORE.

Flat lumps

tender

light

plated

BROWN

a yellow
crust on it

Germany

Terra Vitriolica
Crustata.
H.

for vitriol.

22. RED VITRIOLIC EARTH.

Great cakes

firm

heavy

uneven

REDDISH

fine

Germany

Terra Vitriolica
Rubra.
W.

for vitriol.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
23. BLACK VITRIOLIC EARTH.							
Great masses	tender	heavy	rugged	BLACKISH	coarse	Germany	Terra Vitriolica Nigra. W. for vitriol.
24. GREEN VITRIOLIC EARTH.							
Broad cakes	soft	heavy	rough	PALE GREEN	coarse	Germany	Terra Vitriolica Virescens. W. for vitriol.
25. BLUE VITRIOLIC EARTH.							
Flat cakes	tender	heavy	rugged	DIRTY BLUE	brittle	Ireland	Terra Vitriolica Cerulea. H. for vitriol.

S. A L T S.

ORDER II.

A L K A L I N E.

Acrimonious, and fermenting with Acids.

G E N U S I.

N A T R U M.

A Prism of four sides, with pentagonal planes; with a Pyramid at each end, of two parallellogram planes.

Bitter to the taste; melting on the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PERSIAN NATRON.							
Friable cakes	tender	light	uneven	PALE BROWN	crumbly	Persia	Natrum Antiquorum. L.
2. WALL NATRON.							
A tender efflorescence	soft	light	botryoid	WHITE	like hoar frost	on walls	Natrum Muriatum. L.
3. SPRING NATRUM.							
Small crystals	firm	heavy	glossy	COLOUR- LESS	clustery	Bohemia, by sides of purging springs	Natrum Fontanum. L.
4. EARTHY NATRUM.							
Great cakes	tender	heavy	uneven	BROWN	clayey	Palæstine	Natrum Hæmelquini. L.

5. LIMESTONE NATRUM.

A dry dust	tender	light	uneven	WHITISH	crumbly	England, Italy, on limestone and marble

Natrum
Rupium.
L.

S A L T S.

R r

ORDER III.

NEUTRAL.

Acrid; and not fermenting with Acids.

GENUS I.

SALARMONIA C.

Oblong, furrow'd, sharp-pointed Crystals.

Bitter, and urinous.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. CRUDE SAL ARMONIAC.							
Great cakes	hard	heavy	rugged	GREY	opaque	East Indies	Ammoniacum Concretum. W. a medicine.
2. SANDY SAL ARMONIAC.							
Great lumps	brittle	heavy	rough	BLACKISH	sandy	Greece	Sal Cyrenaicum Antiq.
3. EFFLORESCENT SAL ARMONIAC.							
Downy tufts	tender	light	rugged	WHITISH	crumbly	Persia	Ammoniacum Efflorescens. W.
4. WHITE VESUVIAN SAL ARMONIAC.							
Great cakes	tender	light	cavernous	GREYISH WHITE	fulphure- ous	Vesuvius	Ammoniac Fossil Blanc. W.

Ammoniac Fossile
Rouge.
W.

Ammoniac Fossile
Jaunatre.
W.

Ammoniac Fossile
Verd.
W.

Ammoniac Fossile
Noir.
W.

5. RED VESUVIAN SAL ARMONIAC.

Rude lumps hard heavy rugged REDDISH dusty Vesuvius

6. YELLOW VESUVIAN SAL ARMONIAC.

Rugged hard light spungy PALE
masses YELLOW

Vesuvius

7. GREEN VESUVIAN SAL ARMONIAC.

Flat cakes tender light rugged GREENISH cavernous Vesuvius

8. BLACK VESUVIAN SAL ARMONIAC.

Great lumps hard heavy irregular BLACKISH spungy Vesuvius

NEUTRAL SALT S.

G E N U S II.

B O R A X.

A Prism of eight sides, with a truncated Pyramid at each end.

Disgustful to the taste; vitrifying in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. ROUGH BORAX.							
Rude cakes	hard	heavy	uneven	BLUEISH	opaque	East Indies	Borax Crudus. W. in medicine, and as folder to gold.
2. PURE BORAX.							
Small crystals	tender	heavy	polished	COLOUR- LESS	pellucid	East Indies	Borax Nodus. L. a medicine, and folder.

N E U T R A L S A L T S.

G E N U S III.

R O C K S A L T.

Cubic Crystals; or hexædral.

Sharp to the taste; crackling in the fire.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
I. PURE ROCK SALT. S A L G E M M E.							
Vast masses	hard	heavy	polished	C O L O U R - L E S S	transpa- rent	Poland	in food. Maria Montana, L.
2. RED ROCK SALT.							
Great lumps	hard	heavy	rugged	R E D	femipel- lucid	Hungary	Muria Rubescens, H.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACR.	U S E S.
3. BLUE ROCK SALT.							
Vast masses	hard	heavy	polished	DEAD BLUE	clear	Hungary	Muria Ceruleaens. H.
4. GREEN ROCK SALT.							
Great masses	hard	heavy	smooth	GREEN	clear	Bohemia	Muria Virefcens. H.
5. YELLOW ROCK SALT.							
Great lumps	hard	heavy	rugged	YELLOWISH	clear	Hungary	Muria Flavescens.
6. EFFLORESCENT ROCK SALT.							
Low tufts	soft	light	thready	WHITISH	granulated	Poland, on salt rocks	Muria Germinans. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CUBIC SWISSE SALT.							
Small maffes	tender	heavy	rough	WHITISH	brittle	Swifferland	Neutrum Cubicum. W.
2. OBLONG SWISSE SALT.							
Little clusters	foft	heavy	rugged	YELLOWISH	firm	Germany	Neutrum Parallellopidedum. W.
3. PYRAMIDAL SWISSE SALT.							
Small maffes	tender	heavy	rough	PALE BROWN	brittle	Bothnia	Neutrum Pyramidale. W.

That this is not Rock Salt, or Sea Salt, tho' nearly ally'd to it, is proved by chemical experiments.

N A T I V E F O S S I L S.

C L A S S X.

S U L P H U R E O U S.

Inflammable, electrical, soluble in oil.

G E N U S I.

S U L P H U R S.

Uniform, pure, or earthy; burning with a blue flame, and suffocating smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOR.	QUALITIES.	PLACE.	USES.
1. CRYSTALLINE SULPHUR.							
Small masses	firm	heavy	glossy	PALE YELLOW	transpa- rent	Peru	Sulphur Vivum Pellucidum. W. medicine.
2. YELLOW NATIVE SULPHUR.							
Large masses	hard	heavy	smooth	STRONG YELLOW	opaque	Germany	Sulphur Vivum Opacum. medicine.
3. VESUVIAN SULPHUR.							
Tufts of threads	tender	light	bright	FAINT YELLOW	strong scented	Vesuvius, in cracks of rocks	Sulphur Vivum Capillare. W. medicine.
4. EFFLORESCENT SULPHUR.							
A dust	soft	light	granulated	PALE YELLOW	mild scented	Aix la Chapelle	Sulphur Vivum Efflorescens. W. medicine.

5. WHITE SULPHUR ORE.	Small masses	tender	heavy	rugged	WHITISH	soft	Vesuvius	medicine.	Sulphur Coloratum Album. W.
	Vast cakes	hard	heavy	irregular	DEAD GREY	rough	Iceland	a medicine.	Sulphur Vivum Coloratum. W.
7. GREEN SULPHUR ORE.	Large lumps	hard	light	rugged	GREEN	bright	Vesuvius		Sulphur Coloratum Viride. W.
8. BLACK SULPHUR ORE.	Great cakes	hard	heavy	scaly	BLACK	bituminous	Germany	for sulphur.	Sulphur Coloratum Nigrum. W.

NATIVE FOSSILS.

G E N U S II.

M A R C A S I T E S.

Heavy, metalline, angulated bodies.

I. C U B I C.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. YELLOW CUBIC MARCASITE.							
Regular cubes	hard	very heavy	smooth	GREENISH YELLOW	angles entire	Northumberland, in slate	for sulphur.
2. YELLOW PRISMATIC MARCASITE.							
Oblong pieces	hard	heavy	smooth	YELLOW	irregular planes	Germany	for making sulphur.

Marcasita
Tessellaris.
W.

Marcasita Prismatica
Hexaedra.
W.

3. STRIATED CUBIC MARCASITE.

Marcasita Cubica
Striata
de Lisse.

Small cubes

hard

very
heavy

glossy

WHITISH

striated
contrary
ways

Saxony

for brimstone.

4. RHOMBOIDAL MARCASITE.

Marcasita
Rhomboidalis.
W.

Large masses

very hard

heavy

scaly

YELLOW

crusted

Germany

for brimstone.

5. TRUNCATED MARCASITE.

Marcasita
Truncata.
W.

Large
clusters

hard

heavy

polished

DUSKY
YELLOW

angles cut
off

Sweden

for brimstone.

6. FOURTEEN-SIDED MARCASITE.

Marcasita
Decatefferahædra.
W.

Large
clusters

hard

heavy

glossy

BRONZE OF
GREEN
AND
YELLOW

thready

Germany

for brimstone.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. RUSTY MARCASITE.							
Small cubes	hard	heavy	rugged	RUST COLOUR'D	fourteen faces	England, France	for brimstone. Marcasita Profundius Truncata de Lisle.
8. EIGHTEEN-SIDED MARCASITE.							
Loose cubes	very hard	heavy	smooth	YELLOW	angles cut off	Sweden	for brimstone. Pyrites Crystallinus Octodecahedrus. L.
9. STRIATED RECTANGULAR MARCASITE.							
Great clusters	hard	heavy	scaly	GREENISH	striated	Germany	for brimstone. Marcasita Cubica Striata de Lisle.
10. TWELVE-SIDED MARCASITE.							
Large clusters	very hard	heavy	smooth	BRASSY YELLOW	polished	Sweden	for brimstone. Pyrites Crystallinus Dodecahedrus. L.

P Y R A M I D A L.

Pyrites Crystallinus
Tetrahædrus.
L.

Large clusters	hard	heavy	rugged	GREENISH YELLOW	equal fides	Germany	for brimstone.
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Pyrites
Henkelii
de Lisse.

Small clusters	hard	heavy	polished	BRIGHT BRASSY YELLOW	irregular	Germany	for brimstone.
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Pyrites Pyramidalis
Truncatus
de Lisse.

Great clusters	hard	heavy	rugged	BROWNISH	angles cut off	Germany	for brimstone.
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II. REGULAR PYRAMIDAL MARCASITE.

12. LONG PYRAMIDAL MARCASITE.

13. TRUNCATED PYRAMIDAL MARCASITE.

OCTAHÆDRAL.

3.

Composed of two quadrilateral Pyramids, joined base to base.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
14. REGULAR OCTAHÆDRAL MARCASITE.							
Large clusters	hard	heavy	rough	GREENISH YELLOW	eight equal triangles	Saxony	Marcasite Octædre Regulier de Lisle. for brimstone.
15. LONG OCTAHÆDRAL MARCASITE.							
Single pieces	very hard	heavy	glossy	BRASSY YELLOW	eight unequal triangles	Saxony	Marcasite Octædre Allonge de Lisle. for brimstone.
16. IRREGULAR OCTAHÆDRAL MARCASITE.							
Small clusters	hard	heavy	scaly	YELLOW	eight irregular triangles	Germany	Marcasite Octædre Inegale de Lisle. for brimstone.

17. TRUNCATED OCTAHÆDRAL MARCASITE.	Great clusters	tender	light	polished	BRASSY	angles cut off	Saxony	for brimstone.	Marcasite Octædre Tronque de Lisse.
18. FLATTED OCTAHÆDRAL MARCASITE.	Clusters	hard	heavy	scaly	GREENISH YELLOW	low	Bohemia	for brimstone.	Marcasite Octædre Comprimé de Lisse.
19. OBLIQUE OCTAHÆDRAL MARCASITE.	Single pieces	hard	heavy	polished	GOLD YELLOW	oblique joinings	Germany	for brimstone.	Marcasite Octædre Oblique de Lisse.
20. BRONZ'D OCTAHÆDRAL MARCASITE.	Great clusters	hard	heavy	rugged	BRONZ'D GREEN	solid angles cut off	Saxony	for brimstone.	Marcasite Octahædre a 14 Facettes de Lisse.

4. POLYGONAL MARCASITES.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. TWELVE-SIDED MARCASITE.							
Great clusters	very hard	heavy	scaly	BRASSY YELLOW	two pen- tagonal Pyramids	Germany	for brimstone. Marcasite Dodecahedre de Lisle.
Small clusters	hard	heavy	rude	GREENISH	twenty equilateral triangles	Saxony	for brimstone. Marcasite Icosædre de Lisle.
2. TWENTY-SIDED MARCASITE.							
N A T I V E F O S I L S.							
G E N U S III.							
P Y R I T E S.							
P Y R I T E S.							

Globular, rugged, flattened, or hollow'd; and striated within.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USE S.
1. GLOBULAR PYRITES.							
Round, rough lumps	hard	very heavy	warted	FERRUGI- NEOUS BROWN	large striae	England	Pyrites Figuratus Globosus. L. for sulphur.
2. HEMISPHERIC PYRITES.							
Great cakes	very hard	heavy	rugged	GREENISH BROWN	fine striae	Cornwall	Pyrites Figuratus Haemisphericus. L. for brimstone.
3. HOLLOW PYRITES.							
Oblong masses	tender	heavy	rough	FERRUGI- NEOUS	tubular	Sweden	Pyrites Figuratus Fritulosus. L. for brimstone.
4. PLATED PYRITES.							
Flatted masses	hard	heavy	scaly	GREENISH BROWN	upright scales	Sweden	Pyrites Figuratus Laminosus. L. for brimstone.

NATIVE FOSSILS.

GENUS IV. MUNDIC.

Of no certain shape; heavy, and of a metalline aspect.

T. BRIGHT, AND STRIKING FIRE WITH STEEL.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOR.	QUALITIES.	PLACE.	USES.
1. SMOOTH MUNDIC.							
Flat masses	hard	heavy.	even	DUSKY GREEN	bright	Cornwall	Pyrites Ferri Æquilis. L. for sulphur.
2. GRANULATED MUNDIC.							
Great masses	hard	heavy	rudd	GREEN, AND VIOLET	bright, grain'd	Cornwall	Pyrites Ferri Granulatus. L. for brimstone.

3. STREAKY MUNDIC.

Vast cakes	hard	heavy	smooth	PALE YELLOW	striated, and bright	Derbyshire	for brimstone.
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Pyrites Ferri
Chalybeatus.
L.

2. IMPURE, DULL, AND SCARCE STRIKING FIRE WITH STEEL.

4. SPANGLED MUNDIC.

Great masses	hard	heavy	scaly	WHITISH, AND YELLOW	full of spangles of talc	Germany	for brimstone.
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Pyrites Cupri
Micaceus.
L.

5. TALCY MUNDIC.

Rude lumps	tender	light	flaky	BROWN, AND YELLOW	with plates of talc	Sweden	for brimstone.
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Pyrites Cupri
Talciferus.
L.

6. CHAFFY MUNDIC.

Large cakes	hard	light	rugged, and chaff-like	BLACK, BROWN, AND YELLOW	plates of talc and clay	Germany	for brimstone.
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Pyrites Cupri
Acerosus.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
7. T A W N Y M U N D I C.							
Vast masses	hard	heavy	uneven	YELLOWISH BROWN	bright specks	Sweden	Pyrites Cupri Fulvus, L. for brimstone.
8. G O L D E N M U N D I C.							
Small cakes	very hard	heavy	undulated	GOOD YELLOW	stony mixture	Germany	Pyrites Cupri Flavus, L. for brimstone.
9. G R E E N M U N D I C.							
Great cakes	hard	very heavy	rugged	GREEN	shining	Sweden	Pyrites Cupri Virescens, L. for brimstone.
10. L I V E R M U N D I C.							
Vast cakes	hard	very heavy	raised in lumps	RUDDY BROWN	fine	Sweden	Pyrites Cupri Hepaticus, L. for brimstone.

II. HONEYCOMB MUNDIC.

Pyrites Cupri
Foraminosus.
L.

Rude lumps

hard

light

porous

RUSTY
YELLOW

coarse

Sweden

for brimstone.

12. FIRM MUNDIC.

Pyrites Cupri
Compactus.
L.Vast flat
cakes

very hard

very
heavy

smooth

GREENISH
YELLOWperfectly
fine

Germany

for brimstone.

13. GRITTY MUNDIC.

Pyrites Cupri
Granulatus.
L.Rough
masses

friable

heavy

granulated

RUSTY
YELLOW

coarse

Sweden

for brimstone.

14. RHOMBIC MUNDIC.

Pyrites Cupri
Spatiformis.
L.

Flat cakes

hard

heavy

flaky

GREENISH
YELLOWbreaks in
rhombs

Sweden

for brimstone.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
15. CRYSTALLINE MUNDIC.							
Rude lumps	very hard	very heavy	botryoide	GREENISH YELLOW	breaklike flint	Sweden	Pyrites Cupri Quartzofus. L.
16. STONY MUNDIC.							
Great masses	hard	heavy	rugged	YELLOWISH	very fine	Germany	Pyrites Cupri Cotaceus. L.
17. PURPLE MUNDIC.							
Vast lumps	very hard	heavy	rough	DEEP TAWNY PURPLE	coarse	Sweden	Pyrites Aquoofus. L.

SU L P H U R E O U S

F O S S I L S.

G E N U S V.

A M B E R G R I S E *.

A M B R A.

Light, tender, of a perfumed scent; swimming on water.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. GREY AMBERGRISE.							
Small masses	very tender	very light	smooth	P A L E G R E Y	crumbly	East Indies	Ambra Ambrosiaca. L. in perfumes, and medicine.
2. WHITE AMBERGRISE.							
Little lumps	brittle	light	scaly	W H I T E	friable	Africa	Ambra Unicolora Alba. W. perfume.

* Feathers, and beaks of birds, and fish bones, are often found in Ambergrise.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
3. YELLOW AMBERGRISE.							
Rugged cakes	tender	light	rough	PALE YELLOW	very opaque	Madagascar	Ambra Unicolor Citrina. W.
4. BROWN AMBERGRISE.							
Rounded lumps	hard	heavy	coated	DUSKY BROWN	coarse	Greenland	Ambra Unicolor Fusca. W.
5. BLACK AMBERGRISE.							
Round lumps	hard	heavy	polished	JET BLACK	firm	Greenland	Ambra Unicolor Nigra. W.
6. COARSE AMBERGRISE.							
Rude masses	soft	light	cavernous	DIRTY BROWN	friable	North Seas	Ambra Vulgator. L.

7. YELLOW MOTTLED AMBERGRISE.

Small cakes | very soft | light

8. BLACK MOTTLED AMBERGRISE.

Rude lumps | tender | light

PALE GREY,

WITH YEL-

LOW SPOTS

GREY, AND

BLACK

tough

soft

Sumatra

Madagascar

the finest of per-
fumes.

Ambra Grisea Maculis
Flavis.
W.

Ambra Grisea Maculis
Nigris.
W.

a very fine perfume.

U 2

S U L P H U R E O U S

F O S S I L S.

G E N U S VI.

A M B E R.

S U C C I N U M.

Light, firm, fragrant when rubb'd, and electrical; sinking in water.

I. NATURALY PELLUCID.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PURE YELLOW AMBER.							
Great cakes	firm	very light	polished	PALE YELLOW	pellucid	Prussia	a medicine. Succinum Pellucidum Album. W.
2. MILKY AMBER.							
Small maffes	hard	very light	smooth	WHITISH	pellucid	East Indies	medicine. Succinum Pellucidum Falerum. W.
3. GOLDEN AMBER.							
Large lumps	firm	light	rumpled	GOLD YELLOW	pellucid	the Baltic	medicine. Succinum Pellucidum Rubrum. W.
4. RUDDY AMBER.							
Small maffes	hard	very light	wavy	DUSKY RED	pellucid	Prussia	in medicine.

2. NATURALLY OPAKE.

5. WHITE AMBER.	Rude lumps	hard	light	CHALKY WHITE	opaque	Denmark	medicine, and the arts.	Succinum Opacum Album. W.
6. COARSE YELLOW AMBER.	Great cakes	firm	very light	COARSE YELLOW	foul	Prussia	medicine, and the arts.	Succinum Opacum Flavescens. W.
7. BROWN AMBER.	Small cakes	hard	light	YELLOWISH BROWN	foul	Prussia	medicine, and the arts.	Succinum Opacum Fuscum. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
8. GREY AMBER.				BLUEISH, OR GREENISH GREY			Succinum Opacum Carulescent. W.
Large lumps	hard	light	rugged		foul	Germany	in the arts.

Ambers, coloured by art, should be excluded from a collection of natural curiosities. 'Tis a nice method, and a difficult thing to accomplish; but there are some ingenious Polish Jews, who make a trade of it. A great deal of the pale yellow, streaky Amber has gone through their hands; and I have seen purple, and green Ambers, whose colours were not naturally their own.

Insects, in Amber, make a pretty addition to the kinds, kept in a cabinet; and they are best arranged separately after these; according to the distinct kinds of Amber, which contain them.

S U L P H U R E O U S F O S S I L S.

G E N U S VII. W A T E R - O I L. N A P H T H A.

Very light; very thin; of a strong smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. COLOURLESS NAPHTHA.							
Watery	purest of fluids	lightest of fluids	bright	CLEAR	most inflammable	Media	for light. Naphtha Hyalina L.
2. WHITISH NAPHTHA.							
Whey-like	pure	light	cloudy	BRIGHT	very inflammable	Persia	for lights. Bitumen Naphtha. L.
3. BROWN NAPHTHA.							
Oily	pure	very light	cloudy	PALE YELLOWISH BROWN	strong scented	Persia	in medicine. Naphtha Obscura. W.
4. RUDDY NAPHTHA.							
Oily	pure	light	bright	REDDISH	very strong scented	Italy	in medicine. Naphtha Rubescens. W.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
5. GREEN NAPHTHA. Watery	pure	light	very bright.	GREENISH	less scented	Germany	Naphtha Viridis. W.

SULPHUREOUS F O S S I L S.

G E N U S V I I I .
R O C K - O I L .
P E T R O L E U M .

Light; of the thickness of oil; ill smelling.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. YELLOW PETROLEUM.							
Oily	clear	light	bright	PALE YELLOW	very in- flammable	Italy	Oleum Montanum Luteum. Wolff for lamps.
2. BROWN PETROLEUM.							
X X Oily	foul	light	duffy	RUDDY BROWN	strong scented	Italy	Bitumen Petroleum. L. for lights.
3. BLACKISH PETROLEUM.							
Thick	very foul	light	cloudy	BLACKISH BROWN	earthy	Germany	Petroleum Oleum Terræ. W. in medicine.

SULPHUREOUS FOSFILLS.

G E N U S IX.

E A R T H - O I L.
M A L T H A.

Light; strong scented; thick as Tar.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. R U D D Y M A L T H A.							
Scarce fluid	pure	light	bright	DEEP REDDISH BROWN	sticking to the fingers	Mount Caucasus	for mummies. Bitumen Mumia. L.
2. B L A C K M A L T H A.							
Very thick	[foul	light	cloudy	BLACK	strong scented	Perfia	for lights. Bitumen Maltha. L.

SULPHUREOUS FOSSELS.

G E N U S X.

A S P H A L T H S.
A S P H A L T A.

Light; tough like pitch; brittle; strong scented.

X x 2

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. P U R E A S P H A L T.							Bitumen Asphaltum. L.
Great cakes	brittle	light	rugged	DEEP BLACK	scented	Greece, and Sweden	in medicine.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
2. RUDDY ASPHALT.							
Vast lumps	hard	light	flaky	REDDISH	very stinking	Sweden	Bitumen Hepaticum. L. medicine.
3. TURFF ASPHALT.							
Thick strata	tough	light	most irregular	BLACKISH BROWN	full of roots	England	Terra Bitumenosa Turfacea. W. for firing.
4. DUSTY ASPHALT.							
Great cakes	tender	light	rugged	BLACK	moulders to dust	Germany	Terra Bitumenosa Humacea. W. firing.
5. SLATY ASPHALT.							
Thin strata	hard	heavy	plated	DEEP BLACK	filful	England	Terra Bitumenosa Fifilis. W. firing.

SULPHUREOUS FOS SILS.

G E N U S XI.

C O A L.

L I T H A N T H R A X.

Hard; heavy; stone-like.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. BRIGHT COAL.							
Vast strata	tender	heavy	flaky, and clean	SHINING BLACK	bright	England	for firing. Bitumen Lithanthrax, L.
2. DULL COAL.							
Vast strata	hard	heavy	rugged, and dusty	DEAD BLACK	obscure	England	for firing. Lithanthrax Durior. W.

SULPHUREOUS FOSSILS.

G E N U S XII.

J E T.

G A G A S.

Hard; light; amber-like.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. P U R E J E T.							
Great masses	hard	very light	smooth	FINE DEEP BLACK	swims on water	Germany	for ornaments.
2. B R I T T L E J E T.							
Thick strata	brittle	light	rugged	DEEP BLACK	sinks in water	England	Ornaments, and firing.

Bitumen
Gagas.
L.

Lapis
Ampelites.
H.

SULPHUREOUS FOS SILS.

G E N U S XIII.

O R P I M E N T.

A U R I P I G M E N T U M.

Talc; bright; flexile when pure; burning with a garlic smell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. PLATED YELLOW ORPIMENT.							
Flat cakes	tender	heavy	polished	GOLD YELLOW	flexile, like talc	Smyrna	Pyrites Auripigmentum, in painting.
2. SPANGLED YELLOW ORPIMENT.							
Vast lumps	hard	heavy	scaly	PALE YELLOW	shattery	Turkey	Auripigmentum Flavescens, H, in painting.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
3. SPANGLED RED ORPIMENT*.							
Small lumps	tender	heavy	flaky	BRIGHT RED	in a grey coarse kind	Germany	painting. Auripigmentum Cinnabareum. H.
4. SOLID RED ORPIMENT.							
Great lumps	hard	heavy	smooth	FINE DEEP RED	shattery	Greece	for painting. Sandarachæ Autorum. H.
5. EARTHY YELLOW ORPIMENT.							
Large lumps	soft	heavy	rugged	GOOD YELLOW	brittle	Germany	for painting. Zarnichium Flavum. H.
6. EARTHY GREEN ORPIMENT.							
Great cakes	tender	heavy	rough	DIRTY GREEN	brittle	Germany	in painting. Zarnichium Virefcens. H.

7. EARTHY WHITE ORPIMENT.

Zarnichium
Albescent,
H.

Large lumps	brittle	heavy	rugged	WHITISH GREY	yellow spangles	Germany	in painting.
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* The Yellow Orpiments become red, by burning : but these are so in nature.

SULPHUREOUS FOS SILS.

G E N U S XIV.

A R S E N I C.

A R S E N I C U M.

Cryſtalline; with truncated Priſms; burning with a garlic ſmell.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
1. PURE ARSENIC.							
Clusters of crystals	hard	heavy	polished	COLOUR- LESS	pellucid	Bohemia	a poison. Arsenicum Nudum. L.
2. CRUSTED ARSENIC.							
Small lumps	tender	heavy	scaly	WHITISH	breaks in scales	Hungary	poison. Arsenicum Testaceum. L.
3. FLAKY ARSENIC.							
Flat cakes	soft	light	plated	GREY	fissile	Sweden	a poison. Arsenicum Squamosum. L.
4. HONEYCOMB ARSENIC.							
Rude lumps	hard	heavy	full of holes	WHITISH BROWN	stinking	Bohemia	a poison. Arsenicum Porosum. L.

N A T I V E F O S S I L S.

C L A S S XI.

S E M I - M E T A L S.

Metalline; heavy; not malleable.

G E N U S I.

Q U I C K S I L V E R.

H Y D R A R G Y R U M.

Silvery white; shining; fluid; volatile.

F O R M.	H A R D N E S S.	W E I G H T.	S U R F A C E.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
I. VIRGIN QUICKSILVER.							
Fluid	soft	very heavy	polished	SILVERY WHITE	moveable	Peru, Germany, Sweden	Hydrargyrum Virginum, L. * in medicine, gilding.
2. RUBY QUICKSILVER †.							
A cubic crystal	tender	very heavy	bright	PURE RED	transpa- rent	Germany, Sweden	Hydrargyrum Crystallinum, L.
3. STRIATED CINNABAR †.							
Flatted cakes	hard	heavy	smooth	SCARLET	streaky	China	Hydrargyrum Cinnabaris, L. in medicine, and painting; and for quicksilver

* The variation in the aspect, and mixture of the ores of Metals, is utterly without end. The great attempt must be to distinguish the principal Varieties; and under these, to arrange in the cabinet, those whose farther mixtures render them subor-
dinately various again.

† All the Cinnabars are ores of Quicksilver, with Sulphur.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
4. FLAKY CINNABAR.							
Rude lumps	hard	very heavy	scaly	STRONG RED	friable	Hungary	Hydrargyrum Cinnabaris α . L. for quicksilver.
5. GRANULATED CINNABAR.							
Coarse masses	tender	heavy	rugged	FINE RED	brittle	Germany	Hydrargyrum Cinnabaris β . L. for quicksilver.
6. CRYSTALLIZED CINNABAR.							
Small masses	hard	very heavy	polished	BRIGHT RED	shining	Saxony	Hydrargyrum Cinnabaris γ . L. for quicksilver.
7. JAPAN CINNABAR.							
Small masses	very hard	heavy	smooth	SCARLET	glossy	Japan	Hydrargyrum Glandulosum. L. in painting.

8. EARTHY CINNABAR.						Hydrargyrum Cinnabaris Friabilis Cronstedt.
Small masses	soft	very heavy	dufty	STRONG RED	ochreous	Sweden for quicksilver.
9. CRACKLING QUICKSILVER.						Hydrargyrum Cripetans. L.
Small lumps	hard	very heavy	smooth	RAVEN GREY	crackles in the fire	Sweden for quicksilver.

N A T I V E F O S S I L S.

G E N U S II.

B I S M U T H.

V I S M U T U M.

Yellowish white; flaky; brittle, yet soft.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. FLAKY NATIVE BISMUTH.							
Flat masses	tender	heavy	scaly	SILVERY WHITISH	filfile	Sweden	Vismutum Nativum Squammosum Cronstedt.
2. CUBIC NATIVE BISMUTH.							
Confused clusters	hard	heavy	irregular	YELLOWISH	little cubes	Saxony	Vismutum Nativum Cubicum Cronstedt.
3. EFFLORESCENT BISMUTH.							
A dust	tender	light	powdery	PURE WHITE	spreading on stones	Sweden	Vismutum Efflorescens Cronstedt.
4. SHATTERY BISMUTH ORÉ.							
Great lumps	brittle	heavy	scaly	SILVERY GREY	formed of broad flakes	Sweden	Vismutum Commune. L.

5. SPARKLING BISMUTH ORE.

Small cakes

hard

very
heavy

PALE

YELLOWISH

Sweden

form'd of
small
scales

Vismutum
Squammosum
Cronstedt.

6. WEDGY BISMUTH ORE.

Great lumps

tender

heavy

DUSKY
GREY

of wedge-
like scales

Saxony

Vismutum
Cuneiforme
Cronstedt.

7. STREAKY BISMUTH ORE.

Flat cakes

hard

very
heavy

BLUEISH
GREY

of striated
scales

Germany

Vismutum
Iners.
L.

#

3. TILLY ZINK ORE.

Large lumps firm very heavy

4. PALE CALAMINE.*

Rude masses tender light

5. YELLOW CALAMINE.

Zn Large lumps hard heavy

6. RUDDY CALAMINE.

Small masses brittle very heavy

PALE
GREY

of plates,
like tiles

Germany

Zincum
Mineralifatum.
L.

WHITISH
BROWN

cavernous

England

Lapis Calaminaris
Albescens
Cronstedt.

for zink.

PALE
YELLOW

granulated

England

Zincum
Calaminaris.
L.

REDDISH

stony

Poland

Lapis Calaminaris
Rubescens
Cronstedt.

* All the Calamines are ores of Zink.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. CLAYEY CALAMINE.							
Great cakes	tough	heavy	smooth	YELLOWISH	soft	Germany	Lapis Calaminaris Argillaceus Cronstedt.
8. SWABIAN ZINK ORE.							
Vast masses	hard	very heavy	granulated	PALE GREY	glittering	Sweden	Zincum Swabii. L.
9. FIBROSE ZINK ORE.							
Small lumps	hard	heavy	striated	LEAD COLOUR'D	shining	Germany	Zincum Stibiatum α. L.
10. RIDGED ZINK ORE.							
Small masses	very hard	heavy	uneven	LEAD COLOUR'D	upright scales	Sweden	Zincum Stibiatum β. L.

Zincum
Sterile.
L.

Zincum
Chalybeatum
Cronstedt.

Zincum
Rapax.
L.

Pseudogalena
Virens
Cronstedt.

II. CUBIC BLENDE.*

Great lumps	hard	very heavy
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12. STEEL-GRAIN'D BLENDE.

Great masses	hard	heavy
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13. YELLOW BLENDE.

Flatted lumps	tender	heavy
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14. GREEN BLENDE.

Small lumps	hard	heavy
-------------	------	-------

Germany

bright,
and scaly

BLACKISH
GREY

raised in
ridges

Sweden

glittering

LEAD
COLOUR'D

rugged

Hungary

femi-
transpa-
rent

PALE
YELLOW

smooth

Germany

scaly

DULL
GREEN

rugged

* All the Blendes are also Zink Ores.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
15. BLACK BLEND E.							
Vast masses	hard	very heavy	uneven	DEAD BLACK	breaks in flakes	Sweden	Pseudogalena Nigra Cronstedt.
16. BROWN BLEND E.							
Great cakes	tender	heavy	scaly	DIRTY BROWN	fissile	Germany	Pseudogalena Fusca Cronstedt.
17. WHITE BLEND E.							
Rounded lumps	hard	heavy	granulated with fine scales	WHITISH	femi- pellucid	Sweden	Pseudogalena Alba Cronstedt.
18. LEMON BLEND E.							
Flat cakes	hard	very heavy	scaly, and glittering	VERY PALE YELLOW	pure	Sweden	Pseudogalena Pulcherrima Cronstedt.

19. RUDDY BLENDE.

Great lumps very hard

heavy

rugged

REDDISH
BROWN

sparkling
with small
scales

Germany

Pseudogalena
Rubescens
Cronstedt.

20. UMBER BLENDE.

Vast cakes

hard

heavy

rough

FINE DARK
BROWN

sparkling

Germany

Pseudogalena Sordide
Fusca
Cronstedt.

21. CONGLOMERATE BLENDE.

Rounded
masses

hard

heavy

rugged

BLACK

breaks in
octohedral
forms

Germany

Zincum
Crystallinum.
L.

NATIVE FOSFILLS.

GENUS IV. ANTIMONY.

STIBIUM.

Fibrose; friable; silvery.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
I. NATIVE ANTIMONY.							
Rugged masses	tender	heavy	fibrose	WHITISH	pure	Sweden	Stibium Nativum. L. in medicine.
2. COARSE ANTIMONY ORE.							
Great cakes	brittle	heavy	rugged	LEAD COLOUR'D	thick striae	Germany	Antimonum Mineralisatum Crassius Cronstedt.

3. NEEDLE ANTIMONY ORE.

A. M.
Tenuius
Cronstedt.

Small masses

tender

lighter

WHITISH
GREY

striated

fine striae

Sweden

4. STEEL GRAIN'D ANTIMONY ORE.

A. M.
Chalybeatum.

Great lumps

hard

heavy

STEEL-
COLOUR'D

rugged

sparkling

Germany

5. PYRAMIDAL ANTIMONY ORE.

A. M.
Crysalisatum
Cronstedt.

Small masses

tender

lighter

WHITISH

cavernous,
and
pointed

of concentric
pyramids

Sweden

for antimony.

6. RED ANTIMONY ORE.

A. M.
Solare
Cronstedt.

Great lumps

hard

heavy

REDDISH

striated

of fine
perfect
striae

Saxony

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
7. PURPLE ANTIMONY ORE.							
Great masses	hard	very heavy	streaky, and rugged	DUSKY PURPLE	abrupt striae	Sweden, Hungary	A. M. Abruptum Cronstedt.
8. FEATHER'D ANTIMONY ORE.							
Small lumps	tender	light	feathery	SILVERY WHITE	friable	Germany	A. M. Argentiforme Cronstedt.
9. SILVER ANTIMONY ORE.							
Large masses	hard	very heavy	rugged	DARK GREY	rub to a red pow- der	Sweden	A. M. Argenteo Cupreum Cronstedt.
10. PRISMATIC ANTIMONY.							
Small lumps	hard	heavy	striated	BRIGHT	of multi- lated prisms	Sweden	A. M. Crysalifatum Cronstedt.

II. RADIATED ANTIMONY ORE.

Stibium
Striatum,
L.

for letter-
founders.

Germany

of cross-
ing striae

LEAD
COLOUR'D

thready

heavy

tender

Great lumps

N A T I V E F O S S I L S.

G E N U S V.

C O B A L T.

COBALTUM*.

Fine; brittle; steel-like; whitish grey; not fusible.

* Cobalt has been denied to be a distinct Semi-Metal; but Brandt discovered, and Cronstedt confirmed the fact. Its glass, with the Phlogiston, makes a true Regulus.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. BLACK COBALT.							
Flat cakes	soft	heavy	dufty	DEAD BLACK	earthy, when broken	Germany	Cobaltum Calciforme Nigrum Cronstedt. for arsenic.
2. SLAGGY COBALT.							
Great lumps	very hard	heavy	cavernous	DARK GREY	glossy	Sweden	Minera Cobalti Vitrea Cronstedt.
3. EARTHY RED COBALT.							
Great masses	tender	heavy	dufty	DEEP RED	earth-like	Sweden	Cobaltum Arsenicale Terreum Cronstedt.
4. RUBY COBALT.							
Small masses	very hard	very heavy	glossy	FINE RED	star-like rays	Saxony	Cobaltum Arsenicale Crystallinum Cronstedt.

5. STEEL-GRAIN'D COBALT.	Large lumps	hard	very heavy	rugged	IRON GREY	fine grain'd	Saxony	Cobaltum Chalybeatum Cronstedt.
6. COARSE-GRAIN'D COBALT.	Great masses	brittle	heavy	rough	BLACKISH	granulated	Saxony	Cobaltum Crassius Cronstedt.
7. ARBORESCENT COBALT.	Irregular masses	brittle	light	twiggy	SILVERY	in form of dendrita	Saxony	Cobaltum Dendriticum Cronstedt.
8. POLYHÆDRAL COBALT.	Rounded lumps	hard	heavy	many planes	GREY	shining	Saxony	Cobaltum Polyhædrum Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
9. PYRITINE COBALT.							
Rounded lumps	tender	heavy	botryoide	SILVERY	radiated, when broken	Norway	Cobaltum Radiatum Cronstedt.
10. WHITE POLYGONAL COBALT.							
Small lumps	hard	heavy	angulated	TIN COLOUR'D	bright	Sweden	Cobaltum Polygonum Cronstedt.
11. PALE GLASSY COBALT.							
Great lumps	very hard	heavy	irregular	PALE GREY	glassy	Sweden	Cobaltum Calciforme Album Cronstedt.
12. ORANGE COBALT.							
Great lumps	hard	heavy	angulated	REDDISH YELLOW	bright	Sweden	Cobaltum Glanz Cobalt Cronstedt.

N A T I V E F O S I L S.

G E N U S V.

N I K E L.

N I C C O L U M *.

Solid; shining; reddish; crackly.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
I. S L A G G Y N I K E L.							Niccolum Calciforme Vitrescens Gronstedt.
Vast lumps	hard	very heavy	rugged	ORANGE COLOUR'D	glassy	Sweden	

* Linnaeus doubts the reality of Nikel, as a distinct Semi-Metal; but the same arguments prove it, that prove the Cobalt such; which he allows. The world is infinitely obliged to the Swedish miners for the accurate experiments they have made on Ores; we have a new idea of the metalline art from their labours.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
2. SCALY NIKEL.							
Small masses	hard	heavy	ridgy	DULL YELLOW	flaky	Sweden	Niccolum Squammosum Cronstedt.
3. EARTHY NIKEL.							
Great cakes	brittle	heavy	dufty	DULL GREEN	clay-like	Sweden	Niccolum Martiale Cronstedt.
4. VITRIOLIC NIKEL.							
Small masses	tender	light	rugged	FINE GREEN	ochreous	Sweden	Niccolum Vitriolatum Cronstedt. Cuprum Nikelum. L.

N A T I V E

F O S I L S.

C

L A S S

XII.

M E T A L S.

M E T A L L A.

Heaviest of all bodies; fusible; and ductile.

G E N U S I.

G O L D.

A U R U M.

Soft; yellow; heaviest; and most ductile of all metals.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. SOLID NATIVE GOLD.							
Irregular lumps	tough	heavy	smooth	FULL YELLOW	massy	Peru, China, Africa	Aurum Nativum Solidum. L.
2. PLATED NATIVE GOLD.							
Flat masses	ductile	light in the mass	glossy	PALE YELLOW	flaky	Hungary, Peru	Aurum Nativum Membranaceum. L.
3. SAND NATIVE GOLD.							
Small lumps	tough	heavy	smooth	GOOD YELLOW	in granules	Africa	Aurum Nativum Flavium Cronstedt.
4. ANGULATED NATIVE GOLD.							
Small lumps	tough	heavy	polished	FINE YELLOW	in angulated lumps	Peru	Aurum Nativum Crystallinum. L.

5. ARBORESCENT GOLD.

Branch'd
masses

tough

heavy

twiggy

PALE
YELLOW

in form of
dendritæ

Peru

Aurum
Dendritum,
N.

6. MARCASITE GOLD ORE.

Rude lumps

hard

heavy

smooth

BRASSY
YELLOW

flaky

Sweden

Pyrites
Aureus
Cronstedt.

7. PALE GOLD ORE.

Large cakes

hard

very
heavy

rugged

SILVER
COLOUR'D

striated

Hungary

Aurum
Mercuriale
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	QUALITIES.	P L A C E.	U S E S.
8. GREY GOLD ORE.							Aurum Ferream Cronstedt.
Small lumps	very hard	heavy	scaly	SILVERY GREY	glossy, when broke	Hungary	

Henkel was positive there could be no Gold found in Marcasites; and others have thought that in the nature of things, there could be no Gold Ore: but experiments shew there may be such; and some of the Marcasites are of the number. It were a ruinous error, to suppose all the Marcasites had Gold; but I have seen some that yield two ounces from the hundred weight in certain pieces; tho' little in others, appearing from all obvious characters to be the same.

N A T I V E F O S S I L S.

G E N U S II.

S I L V E R.

A R G E N T U M.

White; shining; very ductile; sonorous.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. FLAT NATIVE SILVER.							
Thin plates	soft	heavy	granulated	REDDISH WHITE	spread on the sur- face of stone	Potosi	Argentum Nativum Superficiale. L.
2. SPANGLED NATIVE SILVER.							
Small flakes	soft	heavy	bright	WHITE	in cracks of rocks	Potosi	Argentum Nativum Bracteatum. L.
3. GRANULATED NATIVE SILVER.							
Clusters of grains	soft	heavy	uneven	REDDISH WHITE	in cracks of rocks	Norway	Argentum Nativum Granulatum. L.
4. CAPILLARY NATIVE SILVER.							
Clusters of fine fibres	tender	heavy	thready	PURE WHITE	in cracks of rocks	Potosi	Argentum Nativum Capillare. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
5. ARBORESCENT NATIVE SILVER.							
In sprigs, in stone	soft	heavy	irregular	PURE WHITE	in masses of stone	Potosi	Argentum Nativum Dendroides. L.
6. CRYSTALLINE NATIVE SILVER.							
Square shoots	hard	heavy	polished	WHITE	in stone	Norway	Argentum Nativum Crystallinum. L.
7. HORNEY SILVER ORE.							
Rude masses	brittle	heavy	glossy	PEARLY YELLOWISH BROWN	in rocks	Norway	Argentum Corneum. L.
8. LEAFY SILVER ORE.							
Flat plates	hard	heavy	rugged	BLACKISH	on stones	Saxony	Argentum Vitreum Superficiale. L.

9. BRISTLY SILVER ORE.

Short spikes

brittle

heavy

DARK
GREYin cracks
of rocks

Sweden

Argentum Vitreum
Subulare,
L.

10. OCTAHEDRAL SILVER ORE.

Rude octa-
hedral lumps

brittle

very
heavy

BROWN

in cracks
of rocks

Saxony

Argentum Vitreum
Crystallinum,
L.

11. FLAKY GREY SILVER ORE.

Flat masses

brittle

heavy

DARK
GREYred, when
powder'd

Hartz forest

Argentum Rubrum
Cinereascens,
L.

12. SOLID GREY SILVER ORE.

Ill-shap'd
lumps

hard

heavy

PALE
GREYred, when
powder'd

Saxony

Argentum Rubrum
Solidum
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
13. GLANDULOSE RED SILVER ORE.							
Small masses	brittle	heavy	rugged	FINE RED	full of rounded masses	Germany	Argentum Rubrum Glandulosum. L.
14. RUBY SILVER ORE.							
Long sprigs	brittle	heavy	polished	RUBY RED	transparent	Saxony	Argentum Rubrum Crystallinum. L.
15. WHITE SILVER ORE.							
Rude lumps	brittle	heavy	rugged	BRIGHT SHINING WHITE	glittering	Hartz forest	Argentum Album. L.
16. MASSY GREY SILVER ORE.							
Great lumps	hard	heavy	rough	PALE GREY	shining	Sweden	Argentum Cinereum Compactum. L.

17. GLOSSY GREY SILVER ORE.

Small
clusters

brittle

heavy

WHITISH

shining

angulated
figures

Sweden

Argentum Album
Crystallinum.
L.

18. PYRITIC SILVER ORE.

Flatted
lumps

brittle

heavy

WHITE

rugged

striated

Sweden

Argentum
Arsenicale.
L.

19. SCALY BLENDE SILVER ORE.

Flatted
masses

brittle

heavy

LEAD
COLOUR'D

tilly

shining

Sweden

Argentum Zincosum
Squamosum
Cronstedt.

20. BALL SILVER ORE.

Round
lumps

hard

heavy

GREY

striated

bright,
when
broken

Germany

Argentum Zincosum
Rotundatum
Cronstedt.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
21. BLACK BLENDE SILVER ORE.							
Rounded lumps	hard	heavy	scaly	BLACK	glossy, when broke	Sweden	Argentum Zincofum Nigrum Cronstedt.
22. STEEL-GRAIN'D SILVER ORE.							
Flatted lumps	hard	heavy	granulated	IRON GREY	glossy	Sweden	Argentum Cinereum. L.
23. SOOTY SILVER ORE.							
Ragged masses	tender	heavy	scaly	DEAD BLACK	opaque	Sweden	Argentum Nigrum. L.

NATIVE FOSSILS.

G E N U S III. W H I T E G O L D. P L A T I N A.

White; hard; heaviest of Metals; scarce ductile.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
I. NATIVE PLATINA*.							
Small grains	hard	most heavy	rugged	WHITISH	opaque	Rio da Pinto	Platinum.

* I must express my doubts whether Platina be a Metal; or the grains we see be native, tho' they are understood to be so: 'tis near forty years ago that we became first acquainted with it. Maregrave supposed it a recement, after amalgamation of Gold, and he found Iron in it. Its weight is not to be accounted for this way; but joined to what Maregrave has said, I may add this one, unthought of trial. Mr. Wolf, excellent in his chemical knowledge, made a preparation from this, to be dissolved and viewed in the act of recrystallizing before the microscope; and thus it afforded Figures belonging to Quicksilver, and Iron; and to no other substances in the world.

NATIVE FOSIL S.

GENUS IV.

TIN.

STANNUM*.

Blueish white; soft; malleable; crackling in bending, and but poorly ductile; fragrant.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. CRYSTALLINE TIN ORE.							
Angulated lumps	very hard	very heavy	polished	BLACKISH	crystalline	Cornwall, Saxony, and France †	Stannum Crystallinum. L.
2. TIN GRAINS.							
Small crystals	hard	very heavy	polished	BLACKISH BROWN	fatty on the surface	Cornwall	Stannum Granulatum. L.

3. TIN STONE.

Stannum
Amorphum.
L.

Large lumps

hard

heavy

smooth

DEEP
BROWN

glossy

Cornwall

4. SPAR TIN.

Stannum
Spathaceum.
L.Round
lumps

brittle

very
heavy

streaky

PALE
BROWN

glittering

Bohemia

* It has been said, there was native Tin; but I think it is an error. A Mass was offered to me at a great price in 1731, which was an Arsenical Pyrites. Since that time, the ingenious Mr. Borlace of Cornwall, thinks he has found native Tin: The account caused letters to pass between us; in which, on my part, were proposed questions that would have determined the matter; but I am sorry to say, the answers were not satisfactory.

† It will seem strange that France is added here to the few places known to afford Tin; but 'tis mentioned, not from conjecture, but the most perfect certainty.

NATIVE FOSILS.

GENUS V.

LEAD.

PLUMBUM.

Soft; blueish white; not sonorous; very ductile.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
1. MASSY NATIVE LEAD.							
Oblong lumps	soft	heavy	rugged	PALE GREY	covered with white powder	Saxony	Plumbum Nativum Solidum. W.
2. GRANULATED NATIVE LEAD.							
Round granules	tender	heavy	smooth	BLUEISH	dufty white	Germany	Plumbum Nativum Granulatum. L.

3. BUBBLY NATIVE LEAD.

Small, rough lumps	soft	heavy
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4. CUBIC LEAD ORE.

Lumps of cubes	hard	heavy
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5. OCTOHEDRAL LEAD ORE.

Large lumps	hard	heavy
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6. ALUMINOUS LEAD ORE.

Small masses	tender	heavy
--------------	--------	-------

raised in bubbles

GREY

dufty white

Germany

Plumbum Nativum
Papillare.
L.

scaly

WHITISH

six even fides

Germany

Plumbum Crystallinum
Hexaedrum.
L.

polished

LEAD
COLOUR'D

eight un-
equal fides

Saxony

Plumbum Crystallinum
Octahædrum.
L.

glossy

BLUEISH

fourteen fides

Germany

Plumbum Crystallinum
Tetradecahædrum.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
7. TRUNCATED CUBIC LEAD ORE.							
Large clumps	hard	heavy	smooth	GREY	angles cut off	Sweden	Plumbum Crystallinum δ . L.
8. TWENTY-SIX-SIDED LEAD ORE.							
Loose pieces	brittle	heavy	scaly	BLUEISH	polygonal	Germany	Plumbum Crystallinum α . L.
9. CUBIC SILVER LEAD ORE.							
Vast masses	brittle	very heavy	flaky	BLACKISH BLUE	shining mixt cubes	Germany	Plumbum Galena Cubica. L.
10. GRANULATED SILVER LEAD ORE.							
Great masses	very hard	very heavy	rugged	BLUE GREY	rich in silver	Germany	Plumbum Galena β . L.

11. CONFUS'D SILVER LEAD ORE.

Rugged lumps | hard | heavy

12. COMPACT LEAD ORE.

Vast masses | hard | very heavy

13. DOTTED LEAD ORE.

Great masses | hard | heavy

14. ANTIMONIATED LEAD ORE.

Great cakes | brittle | very heavy

glittering
confusedly

IRON GREY

scaly

Germany

Plumbum
Galatæna γ.
L.

uniform

BLUEISH

smooth

Germany

Plumbum
Compactum,
L.

shining in
dots

BLUE. GREY

uneven

Germany

Plumbum
Rauperum,
L.

striated

LIGHT
GREY

rugged

Sweden

Plumbum
Stibiatum,
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
15. CLUSTER LEAD ORE.							
Rude lumps	brittle	heavy	streaky	BRIGHT GREY	cross tufts of fibres	Germany	Plumbum Basilinum. L.
16. GREEN LEAD ORE.							
Clusters of crystals	hard	very heavy	irregularly streak'd	GREEN, OR COLOUR- LESS	nitrous crystals	Bohemia	Plumbum Virens. L.
17. RUSSIAN LEAD ORE.							
Great masses of rhombs	hard	heavy	glossy	TAWNY	bright	Russia	Plumbum Rhombium. L.
18. SPARRY LEAD ORE.							
Vast cakes	brittle	heavy	flaky	WHITE	breaks in cubes	Germany	Plumbum Spatosum. L.

19. PELLUCID LEAD ORE.

Plumbum
pellucidum,
L.

Great lumps | hard | heavy

Germany

easily
scraped

COLOUR-
LESS

rugged

20. CERUSS LEAD ORE.

Plumbum
Calciforme
Cronstedt.

Thin cakes | brittle | light

Sweden

on lead
ores

WHITE

dufty

3 D 2

M

E

T

A

L

S.

LICK pieces

G

E N

U S

VI.

COOPER

R.

CUPRUM.

Ruddy; tough; sonorous.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
1. MASSY NATIVE COPPER.							
Thick pieces	tough	heavy	rugged	REDDISH	solid	Virginia	Cuprum Nativum Solidum.
2. PLATED NATIVE COPPER.							
Flat cakes	very ductile	heavy	uneven	REDDISH	dull	Germany	Cuprum Nativum Superficiale. L.
3. FOLIACEOUS NATIVE COPPER.							
Irregular flakes	soft	heavy	uneven	RED	bright	Sweden	Cuprum Nativum Foliaceum, L.
4. EFFLORESCENT NATIVE COPPER.							
Flat, fibrous masses	tender	heavy	rugged	FINE RED	granulated	Germany	Cuprum Nativum Efflorescens, L.

5. CEMENT COPPER.

Rugged
cakes

brittle

light

rugged

DULL
REDDISH

botryoide

Germany

on iron.

Cuprum
Præcipitatum.
L.

6. OCTOHÆDRAL COPPER ORE.

Small lumps

hard

heavy

polished

REDDISH

trigonal
faces

East Indies

Cuprum
Crystallinum.
L.

7. RED GLASSY COPPER ORE.

Great masses

very hard

heavy

rugged

SCARLET

glassy
within

Norway

Cuprum Induratum
Rubrum.
Cronstedt.

8. TAWNY GLASSY COPPER ORE.

Great cakes

hard

heavy

wrinkled

YELLOWISH
BROWN

glassy
within

Sweden

Cuprum Induratum
Fulvum
Cronstedt.

FOR M.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. GREY MARCASITIC COPPER ORE.							
Great lumps	hard	heavy	rugged	BRASSY BLACKISH GREY	striated	Germany	Cuprum Marcasiticum Griseum Cronstedt.
10. LIVER-COLOUR'D MARCASITIC COPPER ORE.							
Flat masses	very hard	heavy	coated	LIVER COLOUR'D	a bluecruft	Sweden	Cuprum Marcasiticum Lazureum Cronstedt.
11. COMPACT BRASSY COPPER ORE.							
Great cakes	hard	heavy	smooth	GREENISH	breaks like brass	Germany	Pyrites Cupri Solidus Cronstedt.
12. STEEL-GRAIN'D BRASSY COPPER ORE.							
Flat masses	hard	very heavy	rough	BRONZ'D YELLOW	breaks like iron	Sweden	Pyrites Cupri Chalybiformis Cronstedt.

Pyrites Cupri
Crassior
Cronstedt.

Cuprum Crystallinum
Octahædricum
Cronstedt.

Pyrites Cupri Pallide
Flavus
Cronstedt.

Pyrites Cupri
Hepaticus
Cronstedt.

13. SANDY BRASSY COPPER ORE.

Great lumps brittle heavy

rugged

GREENISH
YELLOW

glittering

Sweden

14. OCTOHÆDRAL BRASSY COPPER ORE.

Clusters of shattery crystals heavy

angulated

YELLOW

octohæ-
dral
prisms

Sweden

15. GOLDEN MARCASITIC COPPER ORE.

Great cakes hard heavy

scaly

PALE
YELLOW

glittering

Sweden

16. BROWN MARCASITIC COPPER ORE.

Flat cakes brittle heavy

flaky

RUDDY
BROWN

bright

Germany

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
17. COMPACT GREY COPPER ORE.							Minera Cupri Sulphurata Solida Cronstedt.
Rude lumps	tender	heavy	ethy	DARK GREY	cuts like black lead	Sweden	
18. CUBIC GREY COPPER ORE.							Minera Cupri Sulphurata Cubica Cronstedt.
Flat masses	soft	heavy	smooth	IRON. GREY	breaks in cubes	Sweden	
19. ARSENICAL COPPER ORE.							Cuprum Albidum. L.
Rude lumps	brittle	heavy	granulated	WHITE.	shining.	Saxony	
20. STONY COPPER ORE.							Cuprum Cotaceum. L.
Coarse masses.	brittle	light	cavernous	RUDDY BROWN	coarse	Siberia	

21. GREEN SLATY COPPER ORE.

Flat cakes hard heavy

DEEP
GREEN

splits in
thick
plates

Germany

Cuprum
Schistofum α .
L.

22. BLUE SLATY COPPER ORE.

Vast cakes tender light

DEAD
BLUE

splits in
thin scales

Sweden

Cuprum
Schistofum β .
L.

23. LAZULAR COPPER ORE.

Large masses very hard heavy

FINE BLUE

white and
gold spots

Asia

Cuprum
Lazuli.
L.

24. ARMENINE COPPER ORE.

Great lumps hard heavy

PALE BLUE

fine

Asia

Cuprum
Armenus.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
25. MALACHITE COPPER ORE.							
Rude lumps	firm	heavy	kidney'd	FINE PALE BLUE	striated within	Bohemia	Cuprum Malachites. L.
26. BLUE EARTHY COPPER ORE.							
Small cakes	brittle	light	dufty	GOOD BLUE	clay-like	Saxony	Ceruleum Montanum Cronstedt.
27. GREEN EARTHY COPPER ORE.							
Rough lumps	tender	light	uneven	GREEN	ochreous	Germany	Viride Montanum Cronstedt.
28. RED EARTHY COPPER ORE.							
Thin cakes	soft	light	botryoide	RED	crumbly	Bohemia	Rubrum Montanum Cronstedt.

29. BLACK EARTHY COPPER ORE.

Small lumps

brittle

light

dusty

DEEP
BLACK

crumbly

Sweden

30. COAL COPPER ORE.

Great cakes

hard

heavy

flaky

BLACK

yellow
spots

Germany

Nigrum
Montanum
Cronstedt.

Cuprum
Lithanthracum
Cronstedt.

3 E 2

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L

S.

G

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U

S

VII.

I R O N.

F

E

R

R

U

M.

Dark blue grey; glittering; sonorous; only malleable when hot.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
I. NATIVE IRON.							
Small, round lumps	hard	heavy	polished	RUDDY GREY	oily surface	Sweden	Ferrum Nudum. L.
2. RHOMBIC IRON ORE.							
Masses of rhombs	hard	heavy	smooth	RUDDY BROWN	bright, when broke	Sweden	Ferrum Tessulare. L.
3. CUBIC IRON ORE.							
Small cubes	tender	heavy	glossy	BROWN	regular cubes	Germany	Talcum Cubicum. W.
4. * POLYHÆDRAL IRON ORE.							
Rude lumps	hard	heavy	smooth	REDDISH	many faces	Sweden	Minera Ferri Polyhædra Cronstedt.

Minera Ferri
Cellularis
CronstedtiFerrum
Crystallinum.
L.Ferrum
Chalybeatum.
L.Ferrum
Sidericum.
L.

5. HONEYCOMB IRON ORE.

Great cakes | hard | heavy

cavernous

RUDDY
BROWN

glossy

Sweden

6. CLUSTER IRON ORE.

Small, rude
lumps | shattery | heavymost
irregularGLOSSY,
REDDISHcomposed
of small
octohæ-
dres

Sweden

7. STEELY IRON ORE.

Vast cakes | very hard | very
heavy

smooth

DEEP
GREY

compact

Sweden

8. BLACK DOTTED IRON ORE.

Great lumps | hard | heavy

rugged

BLACKISH

rhombic
spots

Sweden

* This Ore, when bedded in Limestone, acquires an addition of Sulphur, which it has in no other state. The excellent Cronstedt found this always: it happily comes in to the support of the doctrine of Sulphur, delivered in a preceding part of this work, under the article Spar.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
9. BLACK PLAIN IRON ORE.							
Vast masses	very hard	heavy	rude	DEEP BLACK	breaks in rhombs	Sweden	Ferrum Rhombicum. L.
10. LIVER IRON ORE.							
Great cakes	hard	heavy	even	LIVER COLOUR'D	breaks in rhombs	Sweden	Ferrum Hepaticum. L.
11. STEEL-GRAIN'D IRON ORE.							
Great masses	very hard	heavy	rugged	RUDDY BROWN	black, when powder'd	Sweden	Ferrum Selectum. L. finest of ores.
12. FINE-GRAIN'D IRON ORE.							
Vast lumps	very hard	very heavy	smooth	BLACK	sparkling	Sweden	Minera Ferri Retractoria Compacta Cronstedt.

13. GRANULATED IRON ORE.

Great masses hard heavy

RUDDY
BLACK

coarse

Sweden

Minera Ferri
Retraetoria Groffior
Cronstedt.

14. SANDY IRON ORE.

Vaſt cakes hard heavy

BLACKISH
GREY

particles
like ſand

Sweden

Ferrum
Arenofum.
L.

15. COMMON IRON ORE.

Great cakes hard heavy

BLACKISH

irregular
particles

Germany

Ferrum
Commune.
L.

16. SOFT IRON ORE.

Rugged
lumps hard heavy

BLACK

ſpangles of
marcaſite

Sweden

Ferrum
Molle.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	U S E S.
17. TALCY IRON ORE.							
Vast rocks	hard	heavy	scaly	DARK GREY	white spangles	Sweden	Ferrum Talcosum. L.
18. MARBLE IRON ORE.							
Great masses	brittle	heavy	irregular	BROWN	black shining grains lines forming rhombs	Sweden	Ferrum Calcarium. L.
19. LINEATED IRON ORE.							
Great lumps	brittle	heavy	streaky	RUDDY BROWN		Sweden	Ferrum Decussatum. L.
20. GREEN IRON ORE.							
Rude pieces	brittle	heavy	rugged	GREEN	specks of ruddy brown	Sweden	Ferrum Virens. L.

21. GRANITE IRON ORE.

Great masses tender heavy

22. FINE-GRAIN'D EMERY.

Vast cakes hard heavy

23. HARSH EMERY.

Great lumps hard heavy

24. CUBIC EMERY.

Rude masses shattery heavy

GRANITE,
LIKE
BLACK AND
WHITE

scaly

shining
black
scales

Sweden

STEEL
COLOUR'D

uneven

reddish in
powder

Greek
Islands.
Peru

for polishing
gems.

REDDISH
GREY

rugged

coarse
grain'd

Sweden

Smiris
Chalybeatus
Croastedt.

REDDISH

most
irregular

glossy
cubes

Sweden

Smiris
Cubica
Cronstedt.

Ferum
Squamosum.
L.

Ferum
Smiris.
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
25. FLAKY EMERY.							Smiris Squammosa Cronstedt.
Flat cakes	brittle	heavy	scaly	RUDDY GREY	thick scales	Sweden	
26. GLIMMERY IRON ORE.							Ferrum Micaceum. L.
Vast lumps	brittle	light	rugged	DARK GREY	shining scales	Sweden	
27. BLUE IRON ORE.							Ferrum Ceruleum. L.
Great cakes	hard	heavy	plated	STEEL GREY	blue scales	Sweden	
28. FIBROSE IRON ORE.							Ferrum Striatum. L.
Rude lumps	brittle	heavy	fibrose lines, rhombic forms	REDDISH GREY	breaks into rhombs	Sweden	

29. HONEY COMB IRON ORE.

Ferrum
Cellulosum.
L.

Rugged
lumps

brittle

heavy

regularly
cavernous

IRON GREY

upright,
bright
flakes

Sweden

30. RED BLOODSTONE*.

Ferrum
Hæmatites α.
L.

Rounded
lumps

hard

heavy

raised in
great glo-
bules

FINE RED

glossy,
striated
within

forest of
Dean

31. BLACK BLOODSTONE.

Ferrum
Hæmatites β.
L.

Rounded
masses

hard

heavy

botryoid

BLACK

shining

Germany.

32. BLUE LIMESTONE.

Ferrum
Hæmatites γ.
L.

Rugged
masses

hard

heavy

raised in
blunt
cones

DEEP
BLUE

glossy

Germany

* The Emeries and Bloodstones are all Iron Ores. The Loadstone is an Iron Ore, which has the quality of attraction, nothing more.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
33. SOLID YELLOW BLOODSTONE. Rounded lumps	hard	heavy	rounded and smooth	PALE YELLOW	glossy	Sweden	Ferrum Hæmatites δ. L.
34. FIBROUS YELLOW BLOODSTONE. Rough masses	hard	heavy	smooth	DEEP YELLOW	thick fibres	Bohemia	Ferrum Hæmatites Flavum Striatum Cronstedt.
35. KIDNEY BLOODSTONE. Cluster'd lumps	hard	heavy	botryoide	BLACK	rhombic, when broke	Sweden	Hæmatites Reniformis Nigrescens Cronstedt.
36. RADIATED BLACK BLOODSTONE. Masses of globes	hard	heavy	cluster'd round lumps	BLACK	thick striæ within	Sweden	Hæmatites Niger Radiatus Cronstedt.

37. FIGUR'D BLACK BLOODSTONE.	Rugged lumps	hard	heavy	rhombic figures	DEEP BLACK	crystaliz'd within	Sweden	Hæmatites Niger Crystallizatus Cronstedt.
38. SOLID RED BLOODSTONE.	Vast lumps	hard	heavy	glossy	FINE RED	compact, as flint	Germany	Hæmatites Ruber Solidus Cronstedt.
39. CRYSTALIZ'D RED BLOODSTONE.	Small masses	hard	heavy	raised in ridges	DEEP RED	crystaliz'd within	Germany	Hæmatites Crystallizatus Cronstedt.
40. STAINING BLOODSTONE.	Great lumps	soft	very heavy	greasy	GOOD RED	stains the hands	Germany	Ferrum Rubricosum. L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
41. SANDSTONE IRON ORE. Vaſt maſſes	brittle	heavy	rugged	BLACKING THE HANDS	full of ſand	Sweden	Ferrum Arenofum. L.
42. REGENERATE IRON ORE. Vaſt maſſes	brittle	heavy	moſt uneven	RUSTY YELLOW	fandy, formed on iron	Sweden	Tophus Marinus. L.
43. GLOMERATE IRON ORE. Great lumps	ſhattery	heavy	rugged	DARK- GREY	of looſe octohæ- dral par- ticles	Sweden	Ferrum Glomeratum. L.
44. GREY IRON ORE. Great maſſes	brittle	heavy	rough	WHITISH GREY	breaks in rhombs	Sweden	Ferrum Spatofum. L.

45. THE LOADSTONE.

Ferrum
Magnes.
L.

Great lumps hard heavy

attracts
iron, and
has its
poles

Germany,
Italy

46. SOFT MANGANESE*.

Magnesia
Terrea
Cronstedt.

Crumbly
masses soft heavy

friable

England

in glass works.

47. WHITE GLOBULAR MANGANESE.

Magnesia Alba
Mineralis
Cronstedt.

Rounded
masses hard heavy

striated
within

Norway

48. PURPLE MANGANESE.

Magnesia
Rubra
Cronstedt.

Rude masses hard very
heavy

radiated
within

Italy

* The Manganeses are Iron Ores; but so poor, some have deny'd them their place among these bodies. The excellent Cronstedt is one of those; and he is a guide in these matters, one would wish to follow; but I have try'd them, and there is not one but has some Iron. Experiment is the test to which I would reduce all opinions; and that obliges me to place the Manganeses among the Iron Ores, tho' last among them.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
49. SOLID MANGANESE.							
Great lumps	shattery	heavy	smooth	PURPLISH	metalline brightness	Germany	Magnesia Solida Cronstedt. in glass works.
50. STEEL-GRAIN'D MANGANESE.							
Large cakes	hard	heavy	rugged	IRON GREY	bright, and shining	Sweden	Magnesia Chalybeata Cronstedt.
51. RADIATED MANGANESE.							
Great lumps	shattery	heavy	streaky	REDDISH	radiated within	Sweden	Magnesia Radiata Cronstedt.
52. KIDNEY'D MANGANESE.							
Connected balls	brittle	heavy	kidney'd	REDDISH GREY	glossy	Sweden	Magnesia Crystallifera Cronstedt.

53. WOLFRA M M A N G A N E S E.

Magnesia Spuma
Lupi
Cronstedt.

Rude lumps

hard

heavy

streaky

IRON GREY

coarse
fibres

Sweden

F

O

S

S

I

L

S.

3 G

Rough cakes

hard

C

L

A

S

S

XIII.

1. ICELAND VOLCANIC

S L A G S.

LOKAL

HARDNESS

WICKEL

S C O R I Æ.

Mineral bodies, calcin'd by subterranean fires.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	COLOUR.	QUALITIES.	PLACE.	USES.
I. ICELAND AGATE.							
Rough cakes	hard	heavy	undulated	GREENISH BLACK	femi- transpa- rent	Mount Hecla, and Ascension Island	Achates Islandicus Cronstedt.
2. RHINLAND MILSTONE.							
Vast masses	hard	heavy	cavernous	BLACK	glass-like	Germany	Lapis Molaris Rhenacus, L.
3. PEARL SLAG.							
Clusters of globules	hard	heavy	botryoide	GREENISH GREY	glassy	Isle of Af- cension	Scoria Margaritacea Cronstedt.
4. ASHY SLAG.							
Granulated dust	tender	light	rough	GREY	crumbly	Vesuvius	Scoria Pulverulenta Cronstedt.

5. LAVA SLAG.

Rude lumps

hard

heavy

rugged

MIX'D OF
ALL CO-
LOURS

glassy

Vesuvius

Scoria
Lava.
H.

6. COMMON GREY PUMICE.

Irregular
lumps

brittle

light

cavernous

OLIVE GREY

of brittle
fibres
withinVesuvius,
ÆtnaPumex
Vulcani,
L.

7. BLACK PUMICE.

Vast cakes

brittle

light

rugged

BLACK

sponge-
like

Vesuvius

Pumex
Niger
Cronstedt.

8. IRON PUMICE.

Flat masses

brittle

heavy

botryoide

PALE
REDDISH

spongy

Volcanos,
and Iron
ForgesPumex
Ferri,
L.

FORM.	HARDNESS.	WEIGHT.	SURFACE.	C O L O U R.	Q U A L I T I E S.	P L A C E.	U S E S.
9. COPPER PUMICE.							
Great masses	brittle	light	frothy	RED	spongy	Isle of Ascension	Pumex Cupri. L.

These are a sort of additional substances to a Fossil catalogue; but they ought to have a place in a cabinet: indeed the Lavas of Vesuvius might make a cabinet alone: but Philosophy must acknowledge it knows little of them.

We should wish to be acquainted with the history of the Fossils, of which they are calcinations, in their native and original state, and that way to be able to refer them to the bodies to which they belong; but of this we have no hope. We know not what were the Fossils of Vesuvius before they were burnt; nor can all the furnaces of chemistry produce such substances as these heroic fires of nature.

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I N D E X.

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Hill, John

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